DOCUMENT RESUME

ED 154 193 CE 015 936

TITLE	Nurse Training Act of 1975. First Report to the Congress, February 1, 1977. Report of the Secretary of Health, Education, and Welfare on the Supply and Distribution of and Requirements for Nurses as Required by Section 951, Nurse Training Act of 1975, Title IX, Public Law 94-63. Health Manpower References.
INSTITUTION	Health Resources Administration (DHEW/PHS), Bethesda, Md. Div. of Nursing.
REPORT NO	DHEW-HRA-78-38
PUB DATE	Feb 78
NOTE	211p.; Not available in hard copy due to reproducibility problems
AVAILABLE FROM	Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402
EDRS PRICE	MF-$0.83 Plus Postage. HC Not Available from EDRS.
DESCRIPTORS	Degree Requirements; Educational Experience; Employment Opportunities; Employment Patterns; *Employment Projections; *Employment Qualifications; *Employment Statistics; Employment Trends; *Geographic Distribution; Health Personnel; *Labor Supply; Minority Groups; *Nurses; Resources; Salaries
IDENTIFIERS	Nurse Practitioners

ABSTRACT

In compliance with section 951 of Public Law 94-63, this first annual report presents and analyzes information on the supply and distribution of nursing personnel. The report is organized into three parts. Part I presents data on the projections of supply, distribution, and requirements of nursing personnel. Also included in this section is a discussion of nurse practitioners. Part II represents a description of the data appearing in the latest studies which are of particular importance in the determination of nursing resources and requirements. The findings are presented in the following broad categories: the total nursing group, including those active and inactive and if active, those on a full- or part-time basis; the employment distribution of nursing personnel including data currently available on nurses in specialized areas; the number of nurses with advanced training or graduate degrees; average compensation of nursing personnel; foreign-trained nurses; and registered nurses with minority backgrounds. Part III summarizes the findings about the nursing personnel in the United States. Appended information includes methodological approaches to the area of requirement determination and tables of data related to part II of the report. (JH)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED154193

FIRST REPORT TO THE CONGRESS FEBRUARY 1, 1977

NURSE TRAINING ACT OF 1975

BEST COPY AVAILABLE

REPORT OF THE SECRETARY OF
HEALTH, EDUCATION, AND WELFARE
ON THE SUPPLY AND DISTRIBUTION OF
AND REQUIREMENTS FOR NURSES
AS REQUIRED BY SECTION 951,
NURSE TRAINING ACT OF 1975
TITLE IX, PUBLIC LAW 94-63

HEALTH MANPOWER REFERENCES

DHEW Publication No. HRA 78-38

U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
PUBLIC HEALTH SERVICE
HEALTH RESOURCES ADMINISTRATION
BUREAU OF HEALTH MANPOWER
DIVISION OF NURSING
HYATTSVILLE, MARYLAND 20782

CE 015 936

U.S. DEPARTMENT OF HEALTH,
EDUCATION & WELFARE
NATIONAL INSTITUTE OF
EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY

Issued: February 1978

For sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402

PREFACE

Quality nursing care was the overriding concern of the expert consultant group that considered in the early sixties the national needs for nurses and ways the Federal Government could assist in providing them. Concern for quality in nursing goes back much further. The direct relationship between quality nursing education and the quality of nursing care had been acknowledged since the establishment of formal programs to prepare nurses 100 years earlier. This relationship assumed greater significance as nursing care became increasingly complex, and the number and types of nursing personnel multiplied to meet the needs of a growing and changing population. With the changes in population there were changes in the patterns of health care, in the role of the nurse, in the organization and delivery of nursing services, and in the education of nurses for this care. These changes raised questions and issues for the nursing profession, for educators, for health care providers, and for consumers. The Federal Government, through its interest, concern, and programs of assistance, has also addressed some of these issues and questions. In some instances the issues were resolved and the conditions were improved; in some, they were aggravated; and in some, the Federal intervention has created areas of controversy.

Improving the quality of nursing care through advanced preparation of nursing personnel for leadership positions was a priority for Federal assistance in the mid-1950's. The professional nurse traineeship program was established specifically to prepare nurses for teaching, administration, and supervision--the greatest need at that time. While there has been an impressive increase in the number of nurses with advanced preparation, such nurses are still in short supply when considered in relation to the needs. For example, the lack of prepared nurse faculty was the major barrier when the Congress and the Department wanted to accelerate the training of specialized nurse practitioners. Advanced training for registered nurses continues to be a priority for nursing.

The Surgeon General's Consultant Group on Nursing recognized the many needs of nursing in 1963. The report, Toward Quality in Nursing, and the recommendations of this Group were the basis for the extensive program of Federal assistance for nurse training. The report addressed not only the numbers of nurses that would be required, but a more important consideration, the level of preparation. The needed improvement in nursing education, in nursing service, and in utilization of nursing personnel, as well as in research for new nursing knowledge and methods, depended on increased numbers of nurses with the necessary advanced training.

The Nurse Training Act of 1964 added Title VIII to the Public Health Service Act and provided an extensive and broad-based program of assistance to schools and students of professional nursing. This authority and subsequent amendments provided the nursing education system with the impetus and support for the needed program development and curriculum improvement; it provided the funds for teaching equipment and facilities, for recruitment efforts and student support. Further, it helped the education system to adapt and respond to the changing needs of the health care system and to the trends and issues and the social pressures of the sixties and early seventies. The Report to the Congress, Nurse Training, 1974, included a summary of the several authorities, appropriation authorizations, and awards for various provisions for the 10-year period.

This report and others have underscored the importance of graduate level preparation for the nurses responsible for teaching in all types of programs, for planning and directing the care given by the more than two million nursing personnel, for providing specialized care, and for the nursing research which will improve nursing education and nursing practice. These are the nurses who determine the quality of nursing care patients receive and the number prepared for these responsibilities is woefully inadequate. Competent administrative leadership is fundamental to assuring quality in the delivery of nursing services and in the education of nursing students, yet only 3.4 percent of the active registered nurses are prepared at the master's level or above, the generally accepted level of preparation for leadership positions.

At the present time many nurses in supervisory and administrative positions do not hold master's or doctoral degrees. Only 2,900 of the nursing service administrators and assistants and 1,260 of the supervisors in the more than 7,000 hospitals, and only 2,400 nurses in the administrative positions in the more than 11,000 community health agencies, are prepared at the graduate level, i.e., hold master's and doctoral degrees. Only 44 percent of the faculty in all schools of nursing are so prepared.

The Nurse Training Act of 1975 (Title IX of P.L. 94-63) continues the previous programs of assistance and allows for additional support for advanced training. New sections were added to Title VIII providing separate authorities and appropriation authorizations for the advanced training of nurses and for the training of nurse practitioners.

Federal support for health manpower education, with the attendant planning and evaluation of such support, presents questions and requires decisions regarding the type and extent of assistance. This increases the need for the most complete and accurate data possible about the numbers already in practice and future needs. The involvement of official and voluntary agencies at all levels in planning for health care delivery requires manpower information on needs and resources on regional, State, and local bases, as well as national.

The Nurse Training Act of 1975 was also responsive to the need for more precise information about nursing personnel, their numbers, preparation, location, and practice. The law included Section 951, Information Respecting the Supply and Distribution of and Requirements for Nurses. This section directed the Secretary of Health, Education, and Welfare to develop procedures, to collect and analyze specific data on a continuing basis, and to submit annual reports to the Congress.

The Public Health Service and the nursing organizations have a long history of developing information on various aspects of the nurse supply. They have worked together for 40 years in the collection and analysis of statistics on nursing personnel, their characteristics, and their preparation. Underlying all of the analysis and planning has been concern for quality care for the patient, and concern that nursing personnel be adequately prepared to meet the changing needs for care.

The requirements of Section 951 provided the Public Health Service with a challenge to develop more sophisticated techniques with which to examine the supply and distribution of nursing personnel and to project nursing requirements for the future. There will then be the opportunity to plan programs to meet these requirements on a more complete and current data base than has been possible in the past.

The nature and extent of the information requested necessitated extensive planning to integrate existing and new procedures and data sources for meaningful analysis and evaluation. Throughout this planning there has been concern for the end product--quality nursing care--and provision for the input of professional nursing judgment to assure that quality which has characterized the projections and planning for nursing in the past.

The first of the annual reports presents the procedures to be used for the required data collection and analysis, and the information available thus far. At the time this report was prepared, studies to determine the requirements for nursing personnel that reflect current and future utilization patterns were not completed. Therefore, this report analyzes primarily information on the supply and distribution of nursing personnel. Subsequent reports will provide more complete and refined information and programmatic implications of the data. The report for 1978 and succeeding years will include discussion of the issues surrounding the preparation and practice of nurses, the implications of the findings for the nursing profession and for the planning of Federal assistance to nursing education.

CONTENTS

Page

Preface i

Introduction 1

Part I: Projections of Supply, Distribution, and Requirements

Supply 11

Distribution of Nursing Personnel 25

Requirements 35

Nurse Practitioners 41

Part II: Nursing Resources

The Total Nursing Group 49

Employment Distribution of Nursing Personnel 54

Registered Nurses with Graduate Degrees or Advanced Training 60

Average Compensation of Nursing Personnel 61

Foreign-Trained Nurses 67

Registered Nurses with Minority Backgrounds 69

Bibliography of Data Sources for Part II: Nursing Resources 71

Part III: Summary of Findings 73

Appendix I: Methodological Approaches

Overview of the National Model of the Supply of, Demand for, and Distribution of Nursing Personnel and Services 79

The Impact of Health Care System Changes on the Nation's Requirements for Registered Nurses in 1985 88

Analysis and Planning for Improved Distribution of Nursing Personnel and Services: State Model 97

A Micro-Model for Nursing Manpower Needs 100

The Assessment of Nursing Service and Resource Distribution Model 106

Appendix II: Tables

II-1.--Number of registered nurses in each State and the District of Columbia, by region, 1972, 1976, and 1980 120

II-2.--Average annual percent increase of registered nurse supply in each State and the District of Columbia, by region, 1966-72 and 1976-80 121

II-3.--Estimated ratio of registered nurses per 100,000 population in each State and the District of Columbia, by region, 1972, 1976, and 1980 122

II-4.--Number of licensed practical nurses in each State, by region, 1974 and 1980 123

II-5.--Average annual percent increase of licensed practical nurse supply in each State and the District of Columbia, by region, 1967-74 and 1974-80 124

II-6.--Ratio of licensed practical nurses per 100,000 population in each State and the District of Columbia, by region, 1974 and 1980 125

II-7.--Estimated percentage distribution of registered nurses in each State and the District of Columbia by educational preparation, by region, 1972, 1976, and 1980 126

II-8.--Employment status of registered nurses in each State and region, 1972 128

II-9.--Employment status of licensed practical nurses in each State and region, 1974 130

II-10.--Field of employment of employed registered nurses in each State and region, 1972 132

II-11.--Employed registered nurses by type of position in each State and region, 1972 134

II-12.--Field of employment of employed licensed practical nurses in each State and region, 1974 . 136

II-13.--Bedside nursing personnel per 100 average daily patients in all AHA hospitals, by type of hospital, by census region, 1972 138

II-14.--Bedside nursing personnel per 100 average daily patients in AHA non-Federal short-term general and allied special hospitals, by State, 1972 139

II-15.--Full-time registered nurses and licensed practical/vocational nurses per 1,000 residents in nursing homes, by region and State, 1973 141

II-16.--Distribution of agencies and nurses employed for public health work, January 1974 ... 142

II-17.--Ratios of full-time registered nurses employed for public health work in State and local agencies with and without local boards of education, by State, January 1974 143

II-18.--Percent of graduations from master's programs by functional area of study, 1964-74 ... 146

II-19.--Average hourly earnings of registered nurses in non-Federal hospitals by type of position, by region and metropolitan area, August 1972 and August 1975 147

II-20.--Average hourly earning of clinical nursing specialists in non-Federal hospitals, by region and metropolitan area, August 1975 148

II-21.--Average hourly earnings of licensed practical nurses and nursing aides in non-Federal hospitals, by region and metropolitan area, August 1972 and August 1975 149

II-22.--Average hourly earnings of registered nurses, licensed practical nurses and nursing aides in privately owned nursing homes and related facilities, by region and metropolitan area, May 1973 150

II-23.--Median annual salaries of registered nurses in selected public health agencies, by type of agency and position, 1972-75 151

II-24.--Median annual salaries of licensed practical nurses and auxiliary nursing personnel in selected public health nursing agencies, 1972-75 152

II-25.--Average weekly earnings of industrial registered nurses, February 1974 and July 1975 ... 153

II-26.--Annual salaries of full-time registered nurses in physicians' offices by geographic region, 1973 154

II-27.--Median salaries of full-time RN faculty members teaching in programs preparing registered nurses and practical nurses for licensure, by region, December 1973 155

II-28.--Median annual salaries of RN faculty members in nursing education programs, December 1973 157

II-29.--Nurses admitted to the United States, 1970-75 158

II-30.--Professional nurses admitted as immigrants, by region and country of last permanent residence, FY 1971-75 159

II-31.--Professional nurses entering the United States as nonimmigrant aliens, by visa category and by region and country of last permanent residence, FY 1972-75 160

INTRODUCTION

Section 951 of Public Law 94-63 includes very specific and detailed directives to the Secretary of Health, Education, and Welfare for information. It requires on a continuing basis the determination of the supply and distribution of nursing personnel and current and future requirements. It also requires the collection of data regarding certain specific factors that impact on supply, distribution, and requirements. These data are to be used to determine the adequacy of the supply in relation to the population and the demand for such services. The section further requires the submission of annual reports to the Congress which will include a compilation and analysis of such determinations and data, and will incorporate recommendations for legislation to achieve an equitable distribution and adequate supply of nurses within the United States and within each State. The specific requirements contained in Section 951 can be found in figure 1 on page 2.

This section requests data in two general areas: (1) the determination of the supply of and requirements for nursing personnel on a current and projected basis, for the Nation as a whole and within each State, and (2) the determination of the distribution of nursing personnel within the United States and within each State and the demand for services which these nursing personnel provide. It further requests data in a variety of areas including the number and distribution of nursing personnel as a whole and according to specialties, activity status, rates of compensation, educational levels, and specialty preparation, and also requests data on nurses who migrate into the United States from other countries.

Comprehensive Plan for Nursing Statistics

In order to meet these statutory requirements for data, a procedural plan for data acquisition and analysis was developed. The plan gave recognition to the fact that over 2.5 million individuals functioning in the health care system or having particular qualifications to so function were covered by the scope of the data requirements while at the same time, the specificity of the data requested involved the separate examination of relatively small segments of the total group. The variety and complexity of the data needs militate against the use of a single collection mechanism; requirements called for an approach that integrated analysis of data collected in a number of different ways and through different sources. Accordingly, the various data elements covered by Section 951 were analyzed and an identification was made of already existing sources of data and their current status.

A body of knowledge touching on many of the aspects included in the legislative data requirements has been built up over the years as a result of regular ongoing data collections carried out by various agencies, both public and private, and past or current special studies. These data, while particularly relevant to a descriptive review of

Figure 1.--Public Law 94-63, Title IX

PART D—MISCELLANEOUS

INFORMATION RESPECTING THE SUPPLY AND DISTRIBUTION OF AND REQUIREMENTS FOR NURSES

SEC. 951. (a)(1) Using procedures developed in accordance with paragraph (3), the Secretary of Health, Education, and Welfare (hereinafter in this section referred to as the "Secretary") shall determine on a continuing basis—

(A) the supply (both current and projected and within the United States and within each State) of registered nurses, licensed practical and vocational nurses, nurse's aides, registered nurses with advanced training or graduate degrees, and nurse practitioners;

(B) the distribution, within the United States and within each State, of such nurses so as to determine (i) those areas of the United States which are oversupplied or undersupplied, or which have an adequate supply of such nurses in relation to the population of the area, and (ii) the demand for the services which such nurses provide; and

(C) the current and future requirements for such nurses, nationally and within each State.

(2) The Secretary shall survey and gather data, on a continuing basis, on—

(A) the number and distribution of nurses, by type of employment and location of practice;

(B) the number of nurses who are practicing full time and those who are employed part time, within the United States and within each State;

(C) the average rates of compensation for nurses, by type of practice and location of practice;

(D) the activity status of the total number of registered nurses within the United States and within each State;

(E) the number of nurses with advanced training or graduate degrees in nursing, by specialty, including nurse practitioners, nurse clinicians, nurse researchers, nurse educators, and nurse supervisors and administrators; and

(F) the number of registered nurses entering the United States annually from other nations, by country of nurse training and by immigrant status.

(3) Within six months of the date of the enactment of this Act, the Secretary shall develop procedures for determining (on both a current and projected basis) the supply and distribution of and requirements for nurses within the United States and within each State.

(b) Not later than February 1, 1977, and February 1 of each succeeding year, the Secretary shall report to the Congress—

(1) his determinations under subsection (a)(1) and the data gathered under subsection (a)(2);

(2) an analysis of such determination and data; and

(3) recommendations for such legislation as the Secretary determines, based on such determinations and data, will achieve (A) an equitable distribution of nurses within the United States and within each State, and (B) adequate supplies of nurses within the United States and within each State.

(c) The Office of Management and Budget may review the Secretary's report under subsection (b) before its submission to the Congress, but the Office may not revise the report or delay its submission, and it may submit to the Congress its comments (and those of other departments or agencies of the Government) respecting such report.

nursing resources, are necessary background to the analytical interpretations required by the legislation. An itemization of the data sources and their availability appears in figure 2 on page 6.

The plan also included other efforts having direct relevance to the section's requirements. Prior to the enactment of the legislation, the Division of Nursing had undertaken an extensive program, involving a number of related projects, to develop more sophisticated techniques that would form the basis for the estimating procedures required to determine and project the supply, distribution, and requirements for nursing personnel.

The existent and ongoing sources were matched against the data needs and an identification was made of those gaps determined crucial to the determinations required by the legislation. Parts I and II of this first annual report contain a summary of data presently available, an identification of various gaps that exist in the data at this time, and an explanation of the way in which ongoing efforts will fit within the structure for future reports. Following are descriptions of (1) the basic overall data systems on nursing personnel that provide the framework for the determinations and (2) the planned data collection activities that will be available subsequently.

Current Systems for the Collection of Nursing Data

The inventories initiated by the American Nurses' Association in 1949 for registered nurses (RNs) and in 1967 for licensed practical nurses (LPNs) use the State licensing system as a vehicle for the collection of national and State data on nurse supply and distribution. National inventories have been conducted at irregular intervals since their initiation: 1949, 1951, and 1956-58, 1962, 1966, and 1972 for RNs and 1967 and 1974 for LPNs. Since 1962, the Division of Nursing has been directly involved in these significant compilations of nursing data. As a result of continual cooperation between the American Nurses' Association and the Division of Nursing the inventories have undergone a broadening in scope and a refinement in methodology. An inventory of RNs is to be conducted for 1977, the data from whichare expected to be available in July 1978. This latest study is being conducted by the American Nurses' Association in cooperation with the National Center for Health Statistics. It will combine data collected through the Cooperative Health Statistics System, and directly from those States not in the Cooperative Health Statistics System, to produce a comprehensive study. Inventories are widely spaced because of the differing time spans involved in the licensing processes in the 50 States, as well as the long period required to assemble and tabulate the data.

Some States have supplemented the nationally conducted inventories by conducting more frequent studies. These have limited usefulness, however, because of their differing time periods and the incompleteness of the data collection.

To provide more current estimates of national nurse supply, the Interagency Conference on Nursing Statistics (ICONS) was formed in 1953, consisting of representatives of the American Nurses' Association, the National League for Nursing, and the Division of Nursing of the Public Health Service. Membership in ICONS has since been enlarged to include representatives of the American Hospital Association, the American Medical Association, and various agencies of the Federal Government. Beginning in 1954, using the American Nurses' Association RN inventory as a base and supplementing this with data from periodic surveys in hospitals, public health agencies, and schools of nursing, ICONS has prepared biennial, and since 1967 annual, national estimates of the employed nurse supply. In addition to the total supply estimate, a distribution of registered nurses by field of practice is prepared from time to time.

ICONS has encouraged the continuation of surveys of nursing supply in three fields: hospitals, community health nursing, and schools of nursing. These are known as employer counts, in contrast to inventory data which come from individual nurses. Until 1953, limited data on nurses employed in hospitals were collected annually by the Council on Medical Education and reported in the census of hospitals that appeared in the May issue of the Journal of the American Medical Association. In 1954, the reporting of this data compilation was transferred to the American Hospital Association. It now appears in August each year in the Annual Guide Issue of Hospitals, Journal of the American Hospital Association. In 1960, collection of data on the employed nurse supply was dropped from the annual survey of hospitals. With encouragement from ICONS and financial support from the Division of Nursing, a special survey of nursing personnel in hospitals was initiated in 1962 and continued at intervals until 1972. A 1976 survey of total hospital manpower, containing selected questions on nursing personnel, is currently being conducted by the National Center for Health Statistics. It is anticipated that these data will be available for the next annual report.

A significant series of data is derived from surveys of public health nurses. Begun by the Public Health Service in 1937, a study was conducted annually until 1960 when a biennial schedule was adopted. The latest survey was conducted by the Division of Nursing in 1974. In line with the overall plan to have the National Center for Health Statistics take responsibility for basic, distributional data, the activity was transferred to that agency. Currently, plans exist to collect these data in 1977.

The National League for Nursing collects data annually from all schools of nursing on admissions, enrollments, and graduations. Begun in 1931, this extensive and regular survey series provides a comprehensive data base for analyzing trends in nursing-student population. In 1962 the League began a biennial survey of faculty in all schools of nursing. The latest data from this series are for 1974.

Planned Data Collection Efforts

To supplement available and ongoing planned data collections, the Division of Nursing considered several special studies to provide a vehicle for the collection of specialized data on registered nurses and to expand the data on compensation and on foreign nurses. Only the first of these is under way--a national sample study of registered nurses. This particular undertaking was planned to address a number of the data needs. It will be used for an ongoing monitoring system to obtain analytical data for measuring rates of change in basic distributional data and the production of analytical data on the total nurse supply and particular subgroups of nurses. Special attention will be paid to the collection of those data that are lacking in the current data resources, to make effective predictions of the supply of registered nurses and those factors impacting on supply. Along with the continuation of the current, ongoing, basic data collection systems that provide a national as well as a small area analysis capability, this study will be of assistance in providing the types of data needed in order to make appropriate determinations and allow for a continual monitoring of nursing resources.

Figure 2--Data sources and availability

Subject	Data source	Status of data source
I. Registered nurses		
A. Distribution by employment status and geographic location		
1. Base information	1972 Inventory of Registered Nurses (American Nurses' Association)	Completed
2. Updating mechanism	Supply models to be developed by:	
	1. ICOHS	Estimated completion December 1975
	2. Analysis and Planning for Improved Distribution of Nursing Personnel and Services (WICHE)	Interim model completed September 1976
	3. Distribution Analysis (Information and Communications Applications, Inc.)	Estimated completion July 1977
B. Requirements for nurses	Models to be developed by:	
	1. Analysis and Planning for Improved Distribution of Nursing Personnel and Services (WICHE, Pugh-Roberts)	See above
	2. Effect of National Health Insurance Proposals on Requirements for Nurses (Vector Research, Inc.)	National - December 1975 State - December 1976
	3. Micro-Model for Nursing Manpower Needs (CSF Ltd.)	December 1976

Figure 2--Data sources and availability (continued)

Subject	Data source	Status of data source
C. Analysis of factors impacting on supply		
1. Nurse characteristics	1972 Inventory of RNs (ANA)	Completed
	Follow-up Study to 1972 Inventory of RNs	Completed
	National Sample Survey	New effort, initial data availability August 1977
	In-Depth Analysis of Career-Pattern Study (National League for Nursing)	August 1976
2. Distribution by location and level of employment		
a. Overall	1972 Inventory of RNs (ANA)	Completed
	Follow-up to 1972 Inventory of RNs	Completed
	National Sample Survey	See above
b. Specific areas: Hospitals	Hospital Manpower Survey (NCHS)	Currently under way, estimated date of completion unknown
Community health agencies	Census of community health agencies, 1974 (DN)	October 1975
Nursing homes	Master Facility Inventory (NCHS)	Continuing study
Educational entities	Nurse Faculty Census (NLN)	Biennial study in even years, completion in fall of year studied

Figure 2--Data sources and availability (continued)

Subject	Data source	Status of data source
Physicians' offices	Survey of Registered Nurses Employed in Physicians' Offices, September 1973 (Chilton Research Services)	Completed
3. Distribution by specialized categories		
a. Advanced training	1972 Inventory of RNs (ANA)	Completed
	National Sample Survey	See above
	Program statistics	
b. Nurse practitioners	Longitudinal Study of Nurse Practitioners (SUNY)	Dependent upon level of data needed
	National Sample Survey	See above
	Program statistics	
4. Input into nurse supply		
a. Student population	Annual Survey of Schools of Nursing (NLN)	Conducted in fall of each year
b. Foreign nurse graduates	Annual Statistics of Immigration and Naturalization Service	Published annually
	Annual licensure statistics (ANA)	Available annually
	Special Survey in Immigration and Naturalization Service of Foreign Nurse Immigrants	Completed

Figure 2--Data sources and availability (continued)

Subject	Data source	Status of data source
5. Compensation of RNs		
a. Hospital	Bureau of Labor Statistics, August 1975 regular study	December 1976
	Special study (BLS) to expand to national geographic coverage the regular three-year cycle of studies and to collect interim annual data	Funds unavailable
b. Community health	Yearly Review (NLN)	Collected spring of each year
c. Nursing homes	21 Metropolitan Areas (BLS)	Three-year interval, last data completed 1973
d. Nurse educators	Survey of Salaries and Mobility (ANA)	1975 in preparation
	Surveys of AAUP and NEA	To be analyzed
e. Industrial	Community Wage Surveys (BLS)	Available annually
f. Federal salary scales	Federal agencies	Available upon request
g. Physicians' offices	Survey of Registered Nurses in Physicians' Offices, September 1973 (Chilton Research Services)	Completed
H. Nurse practitioners	Longitudinal Study of Nurse Practitioners (SUNY)	See above
II. Licensed Practical Nurses		
A. Distribution by employment status	1974 Inventory of Licensed Practical Nurses (ANA)	Completed
B. Requirements for nurses	See IA, IB	

Figure 2--Data source and availability (continued)

Subject	Data source	Status of data source
C. Analysis of factors impacting on supply		
1. Nurse characteristics	1974 Inventory of Licensed Practical Nurses (ANA)	Completed
2. Distribution by location of employment		
a. Overall	1974 Inventory of Licensed Practical Nurses (ANA)	Completed
b. Specific areas	See IC2b for hospitals, community health, nursing homes	
3. Input into nursing supply		
Student population	Annual survey of schools of nursing (NLN)	Collected fall of each year
4. Compensation of LPNs	See IC5a, b, c, f	
Nursing aides		
a. Distribution by location of employment		
1. Hospitals	See IC2b	
2. Nursing homes	See IC2b	
3. Community health agencies	See IC2b	
b. Requirements	See IB	
c. Compensation of nursing aides	See IC5a, b, c, f	

Part I

PROJECTIONS OF SUPPLY, DISTRIBUTION, AND REQUIREMENTS [SECTION 951(a)(1)(A), (B), and (C)]

Supply

Since most of the data bases currently available for generating information on the nursing personnel supply contain 1972 (or, in a few instances, 1974) data, estimating methods had to be developed for current as well as for projected levels. The estimating methods are the same for both current and projected data.

For the purpose of this report, "the future supply of registered nurses and practical nurses" is defined as those nurses who will be available for employment. For the base year (1972 or 1974), "supply" refers to the actual number employed. In the case of nursing aides and attendants, "supply" is defined as those employed. No projections of supply have been made for these nursing personnel.

National Supply of Registered Nurses

The determination of the number of registered nurses that will be available for employment at some future date is based on a number of factors:

1. The number of graduates produced by basic educational programs in the country;

2. The number of nurses from other countries who emigrate to the United States and succeed in obtaining licenses to practice as registered nurses in this country;

3. The number of registered nurses who are actively employed in nursing and remain in active status;

4. The number of registered nurses who withdraw from active status on either a permanent or temporary basis;

5. The number of registered nurses who return to active status after being inactive.

Data are available on an annual basis that indicate the number of individuals admitted to and graduating from basic educational programs in the country each year, and provide sufficient trend information to allow for the projection of these data. Data do not exist that would enable the projection of the other factors with any degree of confidence. However, an approach to the determination of available nursing resources was developed

that utilizes the number of graduates each year in conjunction with data derived from studies that have been made of the total number of nurses with current licenses to practice as registered nurses. The development of this method is attributed to Dr. Nathan Jaspen.1/ The Interagency Conference on Nursing Statistics utilizes this procedure, known as the "net attrition rate approach," for the annual estimation of the supply of registered nurses.2/ Through projections of graduations from basic nursing programs and assumptions about the behavior of the derived net attrition rate, it is possible to utilize the same procedure to prepare projections of the registered nurse supply for future years. The graduation projections represent the net inputs into the nurse supply, while the net attrition rate takes account of the other factors identified as items 2-5 above. Alternative estimates based on this procedure were derived, which indicated that by 1990 the available supply of registered nurses would fall in the range from 1,467,000 to 1,541,000. The series of estimates was based on three series of graduation projections and alternative assumptions of the net attrition rate for the latter years.

Graduations are estimated from alternative assumptions derived from a review of trends suggested by historical data regarding admissions to the three types of basic nursing educational programs that prepare students to take the registered nurse licensing examination. The three types of programs are the associate degree program generally offered in community or junior colleges; the diploma program generally offered in hospitals; and the baccalaureate program offered by senior colleges or universities. Since the three types of programs vary in length, the type of program in which a student enrolls governs the time it takes for that individual to become part of the registered nurse population. The overall number of RN programs has remained fairly constant over the last few years, although the composition of the programs has been changing. In 1975, there were 1,362 programs in the 50 States and the District of Columbia. The number of diploma programs has been declining, and associate degree and baccalaureate programs have increased in number. All three types of programs have tended to increase in size over the years, in that the average number of admissions per program has increased. Although, here too, during the last few years, those figures have been somewhat stable. The graduation series presented in table I provide variations on the two themes--changes in the type of program in which a student enrolls, and changes in overall admissions to nursing programs.

1/ Burton, Meyer; "Development of a Method for Determining Estimates of Professional Nurse Needs," Nursing Research, Vol.6, June 1957.

2/ A methodology that would utilize the available data on the number of State licenses issued to RNs each year and the latest available information on the distribution of RNs to predict the effect of the various factors on the supply of nurses was developed in Jones, D.C., et al., Trends in RN Supply, Division of Nursing, HRA, DHEW Pub. No. (HRA) 76-15, March 1976. An intensive study of this methodology is under way at the present time to determine its utilization as an alternative or addition to the methodology indicated here.

Graduation Series I is based on the following overall considerations:

1. While admissions (first-time enrollments) to basic nursing education programs have continued to increase, the percentage increase between years has declined markedly since the 1972-73 academic year. The Nurse Training Act of 1975 contains a provision for capitation to basic nursing educational programs which requires that the programs must at least maintain admission levels in order to receive this support. Authorizations within the Act carry through the 1978-79 academic year admission period. Accordingly, it is estimated that admissions to basic nursing programs would continue to increase through 1978-79 at a rate consistent with that of the immediate present, 1.5 percent, and would stabilize at the 1978-79 level through the 1984-85 academic year. In line with indications that first-degree first-time enrollments for all postsecondary education are declining, it is anticipated that a moderate decline of 0.5 percent each year would occur thereafter.

2. In terms of admissions to the three types of nursing education programs, it is estimated that the percentage of the total admissions to diploma programs would decline by 1 percent each year; the percentage of admissions to baccalaureate programs would increase by 0.7 percent each year; and the percentage of admissions to associate degree programs would increase by 0.3 percent each year.

3. The length of the program before graduation is 2 years for the associate degree program and 3 years for the diploma program. The length of the baccalaureate program is contingent upon whether the nursing program admits students in the freshman, sophomore, or junior year. Based on recent data, it is estimated that 73 percent of admissions to baccalaureate programs are at the freshman level. Those admitted at the sophomore level represent 15 percent of total admissions to baccalaureate programs, and those admitted at the junior level, 12 percent.

4. The latest calculated completion rates for students, that is, the proportion of those graduating among those admitted in a particular year, are 67 percent for the associate degree students and 74 percent for diploma students. For baccalaureate programs, the rates are estimated at 72 percent for those that enter as students in the freshman year, 83 percent for those entering in the sophomore year, and 93 percent for junior entrants.

Graduation Series II, while maintaining the same considerations with regard to overall admissions to schools and the same estimates of completion rates for each program, in effect increases the number of graduates each

year by estimating a more rapid decline in diploma school admissions and having these absorbed by associate degree programs. It further estimates that the proportion of entrants to baccalaureate programs that would be considered admissions in their junior year would increase, and the proportion considered to be admissions in their freshman year would decrease.

Graduation Series III, while maintaining the relative relationships among the three types of basic nursing educational programs as indicated in Series I, estimates more constraints in overall admissions by predicting that admissions would remain at the same level from the 1975-76 academic year through the 1978-79 academic year, and then decline by 0.5 percent each year thereafter.

Table 1 presents the estimated projections of the number of graduates from basic nursing educational programs resulting from the three series outlined.

Based on data from the 1966 and 1972 inventories of registered nurses, it has been estimated that the average annual net attrition rate is 2.1 percent.3/ A review of data prior to that time indicates higher attrition levels; the rate computed for the immediately preceding time frame was 3 percent. The 2.1 percent rate reflected some special occurrences which took place during the 1966-1972 period, such as the advent of Medicare and Medicaid, the dramatic increase in nurses' salaries in the earlier part of the period, and the relatively sizeable increase in graduations from basic nursing educational programs that occurred during the time frame. It is assumed that those events have stabilized and that the net attrition rate will revert to the previous 3 percent by 1980. Recognizing the decline in the increasing rate of new graduates and the relatively large proportion of associate degree graduates who are more likely to be from an older population than other graduates, we further assume that the net attrition rate will increase to 3.5 percent by 1985 and, alternatively,

1. will remain at 3.5 percent through the rest of the projection period; or

2. will increase to 4 percent by 1990.

3/ Marshall and Moses, RN's 1966, An Inventory of Registered Nurses, American Nurses' Association, 1969, and Roth and Walden, The Nation's Nurses, 1972 Inventory of Registered Nurses, American Nurses' Association, 1974. These studies are described in Part II of the report.

Table 1.--Projections of graduations from basic educational programs preparing students to become RNs

Academic year	Series I				Series II				Series III			
	Total	Baccalaureate	Diploma	Associate degree	Total	Baccalaureate	Diploma	Associate degree	Total	Baccalaureate	Diploma	Associate degree
1973-74[1/]	67061	16957	21185	28919	67061	16957	21185	28919	67061	16957	21185	28919
1974-75[1/]	73915	20170	21562	32183	73915	20170	21562	32183	73915	20170	21562	32183
1975-76	76900	23900	19900	33100	76900	23900	19900	33100	76900	23900	19900	33100
1976-77	77900	25500	18300	34100	78100	25700	18300	34100	77900	25500	18300	34100
1977-78	79400	27100	17500	34800	80200	27500	17500	35200	78800	27000	17500	34300
1978-79	80700	28100	17000	35600	81500	28600	16700	36200	79200	27900	16700	34600
1979-80	81900	29100	16400	36400	82800	29700	15800	37300	79200	28500	15900	34800
1980-81	82500	30100	15800	36600	83500	30800	14800	37900	78900	29000	15100	34800
1981-82	82900	31100	14900	36900	83600	31700	13500	38400	78700	29600	14200	34900
1982-83	82900	31700	14100	37100	83700	32400	12400	38900	78300	30100	13300	34900
1983-84	82800	32300	13200	37300	83800	33100	11200	39500	77900	30500	12400	35000
1984-85	82800	32900	12400	37500	83900	33800	10000	40100	77400	30900	11500	35000
1985-86	82800	33500	11500	37800	83700	34400	8700	40600	77000	31300	10700	35000
1986-87	82600	34100	10700	37800	83500	35100	7500	40900	76600	31700	9800	35100
1987-88	82300	34600	9800	37900	83200	35700	6300	41200	76300	32200	9000	35100
1988-89	81800	35100	8800	37900	82600	36200	5100	41300	75900	32600	8100	35200

1/ Actual data reported by National League for Nursing, State-Approved Schools of Nursing-RN, 1975 and 1976.

The estimates of registered nurse supply presented in table 2 take into account the considerations outlined above.4/

Table 2.--Estimates of the supply of registered nurses in the United States, 1975-1990

As of Jan. 1	Series I		Series II		Series III	
	A	B	A	B	A	B
1975 1/	906,000	906,000	906,000	906,000	906,000	906,000
1976 1/	961,000	961,000	961,000	961,000	961,000	961,000
1980	1,166,000	1,166,000	1,168,000	1,168,000	1,164,000	1,164,000
1985	1,372,000	1,372,000	1,377,000	1,377,000	1,351,000	1,351,000
1990	1,532,000	1,511,000	1,541,000	1,520,000	1,488,000	1,467,000

1/ Estimates of current supply for that date from the Interagency Conference on Nursing Statistics.

Assumptions that are made about the net attrition rate can have a marked effect on projections of the nurse supply. The estimates shown in table 2 for 1990 are not dramatically different. However, they should be viewed in terms of their two main components of change. For example, the number of graduations indicated for 1988-89 in Series I is 81,800 and Series III, 75,900, a 7.8 percent difference. Under the assumptions that the net attrition rate would stabilize at 3.5 percent, the projected number of nurses in the supply at the beginning of 1990 is 1,532,000 utilizing Series I graduations and 1,488,000 utilizing Series III graduations. This is a 3.0 percent difference between the two projections of the registered nurse supply.

A number of assumptions can be made about the behavior of the net attrition rate. Those used in these projections are based on the best analysis that can be made at this time. However, the effect of these can be seen from looking at some other assumptions. If one were to take the extreme position that the net attrition rate would remain at the observed rate of 2.1 percent for the 1966-1972 period, considered unlikely in the earlier discussion, the estimated supply for 1990 would be 1,712,000, utilizing the Series I graduation projections. On the other hand, if one were to assume that the net attrition rate would increase over the projection

4/ Prior projections along these lines were presented in Source Book, Nursing Personnel, Division of Nursing, HRA, DHEW Pub. No. (HRA) 75-43, December 1974, and The Supply of Health Manpower, 1970 Profiles and Projections to 1990, DHEW Pub. No. (HRA) 75-38, December 1974. The projections included here represent revisions of those estimates resulting from a review, and utilization of data becoming available after those publications were prepared.

period until it reached 5.0 percent in 1990, the estimated supply in 1990 would be 1,444,000, based again on the Series I graduation projections.

As indicated previously, a consistent series of data has been collected annually on nursing schools and students, from which one can develop interpretations of trends. Little information exists, however, on the individual components of change in the nurse supply (such as shifts in activity status among those already part of the nurse population) that together comprise the net attrition rate. It is in this area that particular attention is being paid, both in terms of finding estimating approaches and in developing a data collection mechanism that would provide greater insight into those components.

Another aspect of the nurse supply is the effective service which is provided by employed nurses. A relatively large segment of employed nurses work on a part-time basis, estimated at the present time at 29 percent. More study is needed to determine appropriate trends in the full- and part-time components of the nurse supply. However, if one were to consider that in 1990 the situation would be as it is today, the full-time equivalent nurse supply, based on the Series I-A projection of the total nurse supply of 1,532,000, would be 1,310,000.

National Projections of Registered Nurses by Educational Attainment

Comparable projections for the registered nurse supply according to educational preparation are presented in table 3 for the Series I, A and B projections, appearing in table 2. The net attrition rate for each educational component changes in a fashion which retains the assumed overall national net attrition rates discussed previously. The net attrition rate for the master's and doctoral component was maintained at the same level as the attrition rate evidenced in the 1966-1972 time period. The associate degree/diploma and baccalaureate components have an initial net attrition rate as calculated also from the 1966-1972 time period. Because of the variation in both the proportion of nurses within each educational component as it relates to the total nurse supply and, after 1976, the overall national net attrition rate, analytical controls were assumed for these components in order to preserve the given overall national net attrition rate.

An additional factor must be incorporated in the projection process: ascension of nurses from one educational component to another as a result of their earning higher degrees. Therefore, the projections assume that all postbaccalaureate graduates are either associate degree or diploma nurses and are removed from the associate degree/diploma component totals. Likewise, those nurses graduating with master's degrees are assumed to be baccalaureate nurses and are removed from that component's total.

Table 3.--Estimates of the supply of registered nurses in the United States according to educational preparation, 1975-90

As of Jan. 1	Total	Asso. degree/ diploma	Bacca-laureate	Master's & doctoral
		Series I-A		
1975	906,000	731,000	144,000	31,000
1976	961,000	765,000	163,000	33,000
1980	1,166,000	866,000	256,000	44,000
1985	1,372,000	930,000	382,000	60,000
1990	1,532,000	946,000	507,000	79,000
		Series I-B		
1975	906,000	731,000	144,000	31,000
1976	961,000	765,000	163,000	33,000
1980	1,166,000	866,000	256,000	44,000
1985	1,372,000	930,000	382,000	60,000
1990	1,511,000	930,000	502,000	79,000

The projection results, when analyzed with each educational component in view, show subtle but important implications in terms of the composition of nursing manpower in the future. Evident in both projections is the increase of baccalaureate nurses from less than 16 percent to over 33 percent of the nurse supply. The numerical decline, in both projections of the associate degree/diploma component from nearly 81 percent to just under 62 percent of the nurse supply, is equally evident. The master's and the doctoral component demonstrates important increases--from 3.4 percent to approximately 5.1 percent and 5.2 percent in the A and B projections, respectively--although they are less dramatic because of the relatively small size of this component. The apparent "leveling off" of the number of nurses in the associate degree/diploma component, while indicating a decrease in the rate of entry of nurses into this component, must be treated with caution, as it occurs in the last years of the projection period and may not necessarily herald a strict numerical decline of the nurses in that component.

National Supply of Licensed Practical/Vocational Nurses

As is the case for registered nurses, there is a multiplicity of factors that need to be taken into account in the determination of the number of licensed practical nurses (known as licensed vocational nurses in California and Texas) who would be available for employment. Here, too, the type of data necessary for projections of these various factors is not generally

available, though for these nurses, as for registered nurses, there are annual counts of graduations from schools of practical nursing.

However, for practical nurses there has not been the consistent series of studies on the total number of nurses with licenses to practice. Estimates of the number of employed licensed practical nurses have been derived from data on the numbers employed in the various types of employment settings for which such information was available, from surveys of these employment settings, and assumptions about the numbers that may have been employed in other types of settings.

The first study of the total licensed group was made in 1967.5/ Recently, data from a second such study have become available. These data describe the licensed practical nurse population in 1974.6/ Preliminary examinations of the data from this latest study have resulted in some revisions in prior estimates of the licensed practical nurse supply. These data also provide an ability to make projections of the licensed practical nurse group utilizing the methodology described for the registered nurse projections. Tentative estimates along these lines indicate that the supply of licensed practical nurses in 1990 would equal from 647,000 to 697,000. It is anticipated that a more intensive analysis of the 1974 study data, licensing data, graduation data, and related considerations will lead to refinements in these estimates.

The estimates presented here were prepared on the basis of the following considerations:

1. Inasmuch as practical nursing programs are 9 to 12 months in length, trends in graduations from practical nursing schools were used, rather than admissions, which were used for registered nurses. The majority of these programs are in secondary, technical or vocational schools, with about one-quarter in junior or community colleges. For the future, it was assumed that graduations would vary in relation to predicted estimates of high school graduations. In the last year for which data were available (1974-75 academic year), the ratio of all practical nursing graduations to all high school graduations was 1.45 percent. A very similar percentage was found for the 3 prior years. Therefore, graduations from practical nursing programs were estimated as 1.45 percent of estimated high school graduations. This resulted in the estimated graduations presented in table 4.

5/ Marshall and Moses, LPN's 1967: An Inventory of Licensed Practical Nurses. Division of Nursing, NIH, PHS, DHEW, January 1971.

6/ The report of this study will be available from the American Nurses' Association.

Table 4.--Projections of graduations from programs preparing students to become LPNs/LVNs

Academic year	Number of practical nursing graduations
1973-74 1/	45,002
1974-75 1/	45,375
1975-76	45,500
1976-77	45,500
1977-78	45,600
1978-79	45,400
1979-80	44,700
1980-81	44,000
1981-82	42,700
1982-83	40,900
1983-84	40,000
1984-85	38,900
1985-86	38,300
1986-87	38,800
1987-88	39,700
1988-89	40,500

1/ Actual data reported by the National League for Nursing, State-Approved Schools of Nursing-LPN, 1975 and 1976.

2. Based on the data in the 1967 and 1974 studies of the licensed practical nurse population, it was estimated that the average annual net attrition rate was 5.3 percent. Two alternative assumptions were made as to the behavior of this attrition rate in future years:

   A. The 1967 and 1974 studies showed a sizable decrease in the median age of licensed practical nurses. Also, although there was a substantial increase in the number of practical nurses with licenses to practice, the older age categories showed substantially less change in numbers. Therefore, it was assumed that the net attrition rate would decline to 4 percent by 1990, closer to that of the registered nurses, as indicated in column A, table 5.

   B. Increasing numbers of licensed practical nurses have been seeking further education toward becoming registered nurses. Here it is assumed that the age considerations mentioned above would be offset by such occurrences as increasing encouragement of licensed practical nurses to go into programs which will prepare them to become registered nurses and, therefore, the net attrition rate would remain at the 1967-74 level, 5.3 percent, as indicated in Column B, Table 5.

The above considerations result in the projected estimates of the licensed practical nurse supply appearing in table 5.

Table 5.--Estimates of the supply of licensed practical or vocational nurses in the United States, 1975-90

As of Jan. 1	A	B
1975 1/	468,000	468,000
1976 1/	489,000	489,000
1980	566,000	561,000
1985	639,000	618,000
1990	697,000	647,000

1/ Based on actual reported graduations and the observed net attrition rate.

State Supply of Nursing Personnel

In order to predict the nursing supply that may be available within a State, one has to take account of the same factors that need to be considered for the determination of national nursing resources. These include numbers of new inputs, both United States and foreign educated, and changes among those already in the licensed group, from employed to not employed status or from not employed to employed status. For State estimates, however, there are additional factors which are important to take into consideration. These relate to questions of interstate mobility and affect both the number of graduates that add to a State's supply and the number of those already in the nurse population in the State, on an actively employed or inactive basis. As is the case for the previously mentioned factors, there is insufficient data available on the migration patterns of nurses to allow for projections of the impact of this factor on the State's nurse supply. This area has been targeted for particular emphasis in subsequent data collection activities and analysis.

Nevertheless, given the existence of two sets of data for the registered nurses and licensed practical nurses, (annual graduations information and the 1966 and 1972 inventories of registered nurses and the 1967 and 1974 inventories of licensed practical/vocational nurses), the net attrition rate approach used for the national estimates can be applied to the State estimates.

Here it is important to recognize that subsumed within the net attrition rate for States are not only those factors that are included within the national net attrition rates but also the one of interstate mobility mentioned above. The importance of mobility on the number of

nurses in each State's supply can be seen from a special study that was made of the 1966 and 1972 "Inventories of Registered Nurses" in which those individuals who were determined as matching in both studies were examined as to the State in which they were located in 1966 and 1972. Almost 16 percent of this group were identified in a different State in 1972 from the State identified in 1966. The percentage was much higher for the youngest segment of registered nurses. Thirty-two percent of those who were under the age of 25 in 1966 were identified in a different State in 1972. This study is only suggestive of the degree of mobility among registered nurses. It did not take into account those people for whom it could not be determined whether or not they were in both inventories (15 percent of the individuals in the 1966 inventory). It also did not account for changes that may have occurred between the dates of the two studies or for nurses who may have entered into the nurse force between 1966 and 1972. The latter group undoubtedly would more likely be in the younger age segments of the nurse population.

The Western Interstate Commission for Higher Education, in its work on State-by-State nursing distribution, did make preliminary projections of the numbers of registered and licensed practical nurses using the net attrition rate approach. The estimated number of nurses in each State through 1980 appears in tables II-1 and II-4 in appendix II. These projections will undergo further refinement for subsequent reports.

In these projections a static situation was assumed for future estimates in that:

1. Admissions to basic nursing educational programs preparing students to become registered nurses were maintained at the last value which could be obtained from actual available data (1974-75 academic year for total admissions and fall 1975 for fall admissions). Graduation completion rates were maintained at the levels determined from the latest data reported in each State.

2. Graduations from practical nursing programs were maintained at the last level which could be determined from reported data.

3. The average annual net attrition rates for each State were assumed to be constant throughout the period at the rates derived from the inventory periods (1966 and 1972 for registered nurses and 1967 and 1974 for licensed practical nurses).

To bring the projections in line with national estimates of nurse supply, the State-by-State estimated totals of employed nurses in 1966 and 1972 in the case of registered nurses, and in 1974 for licenses practical nurses, were adjusted to the national estimates for those dates.

The percentage increases in the nurse supply that resulted during the projection period were examined in comparison to the observed increases in the years intervening between inventory periods to determine how, given the assumption of little change in the observed trends, the increments to the nurse supply in each State would react. These data appear in tables II-2 and II-3 in appendix II.

On a State-by-State basis, for registered nurses, seven States showed lower average annual percentage increases in the period 1976-1980 than were shown for the 1966-72 period. The remaining predictions had about the same or higher rates of increase. Four of the States showing lower average annual percentage increases were among the seven States comprising the West North Central part of the country. The gains showed by States in the 1976-1980 period over the 1966-1972 period varied from those which were relatively minor to some that were substantial. A large proportion of those States showing substantial gains in the rates of increase for the latter period are in the Southern part of the country which generally has shown relatively low ratios of nurses per 100,000 population when these have been used for State-by-State comparisons. The resulting effects of these increments to the nurse supply in relation to the State nurse/population ratios are discussed at a later point when interstate variability is examined.

The average rates of change for licensed practical nurses showed a different picture from those of registered nurses in that the rates of change for the 1974-80 period are mainly lower than those of the 1967-74 inventory period. In part, this is due to the assumptions that were made about graduations. In the case of registered nurses, for the projection period used, a large segment of the graduations could be estimated from actual admissions to the programs, since they are at least 2 years in length and a large proportion of the baccalaureate programs are 4 years in length. Thus, the impact of changing admission levels are reflected in the data. Since practical nursing programs are only 9 to 12 months in length for the most part, the projected graduations for the 1975-76 through 1978-79 academic years were maintained at the same level. In relation to this, however, it is important to note that for many States the graduation levels in practical nursing schools have been fairly constant during the last few years.

Educational Attainment of Registered Nurses in Each State

The Western Interstate Commission for Higher Education also made projections of the educational attainment of registered nurses within each State through 1980. The same approach that was used for the national projections of educational attainment was used on these State estimates. Graduations from both basic and post-RN educational programs were maintained at their last observed level as outlined for the overall State supply estimates, with one exception, the trend in graduations from master's degree programs. For the master's degree graduates, it was assumed that their

graduations would continue the trend observed in the past. The average annual net attrition rate for each educational component of the nurse supply was maintained at the 1966-1972 observed rate.

The proportionate distribution of the nurses within each State according to educational preparation for the years 1972, 1976, and 1980 appears in table II-7 in appendix II. The proportion of the State's supply that consists of nurses whose highest education is associate degree or diploma, showed a decline over the years in all but five States. Nevertheless, this group still will represent a very sizeable proportion of the nurse supply. For about half the jurisdictions it was estimated that at least three-quarters of the total nurse supply will be composed of associate degree and diploma nurses by 1980. Thus, given the increasing numbers of nurses in each State, despite the decrease in the proportion of nurses with associate degrees or diplomas, the number of nurses with this educational level will increase.

In all except three States, the proportion of the supply that will comprise baccalaureate nurses will increase during the period. However, by 1980, in only about one-fifth of the States will the baccalaureate component equal at least 25 percent of the State's total nurse supply. While the master's- and doctoral-level nurses generally showed higher proportions by 1980, in most States they still were a relatively small proportion of the total supply.

Distribution of Nursing Personnel

Section 951(a)(1)(B) of Public Law 94-63 is concerned with the geographic distribution of nursing personnel for the purpose of determining the extent to which areas are adequately supplied with nursing resources.

Two approaches have been taken toward analyzing geographic distribution of nursing personnel. The first is concerned with the variation from State to State. Here the traditional measure is the nurse/population ratio. However, distribution within States requires not only analysis of the nurse/population ratio, but study of how an area's population receives its services. Therefore a second approach is being developed. This is an analytical tool whose preliminary usage will be illustrated in this report, while subsequent reports will contain more definitive results of the application of this tool.

As will be noted from a review of the data in this section, there have been consistent increases in the ratios of nurses-to-population over the years, and the projections of future nurse supply indicate a continuance of this trend. However, it should be indicated that nurse-to-population ratios do not address the adequacy of supply in relation to an area's requirements. To determine whether an area is adequately supplied with nursing personnel requires the matching of the supply of nursing personnel to the demand for their services. Currently being developed and field tested is a tool known as the State Model that will enable the analysis of an area's nursing supply in relation to its requirements. The results of this analysis will be included in subsequent annual reports.

Distribution of Nurses from State to State

The most commonly used measure employed in assessing the distribution of the supply of registered nurses is the RN-to-population ratio. State ratios of employed registered nurses per 100,000 population resident in the State present the relationship of registered nurses working in the State to the population of the State without regard to type of employment.

State RN-to-population ratios have two uses. The first is in the determination of the relative status of a State compared to other States. The second is in the analysis of the change of the ratio for a State over a period of time. Table 6 shows the distribution of RN-to-population ratios according to frequency of the ratios' occurrence among the States. These data demonstrate the range of the ratios for 1963, 1966, and 1972. The variation among the States is very high, the difference between the lowest and the highest States being about threefold.

In 1972 there were 7 States with ratios in the 150 to 250 strata and 5 in the 550 to 650 strata. These States comprise 24 percent of the States, 19 percent of the population, and 18 percent of all registered nurses in the United States. Those States in the lower strata (14 percent

of all the States) had 14 percent of the population and 9 percent of all registered nurses in the United States. Those States in the upper strata (10 percent of all the States) had 5 percent of the population and 9 percent of all registered nurses in the United States.

In 1966 there were 9 States with ratios in the 100 to 200 strata and 5 States in the 400 to 550 strata. These States comprise 27.5 percent of the number of States, 23.7 percent of the population, and 19.2 percent of all registered nurses in the United States. Those States in the lower strata (17.6 percent of all the States) had 18.5 percent of the population and 10.6 percent of all registered nurses in the United States. Those States in the upper strata (10 percent of all the States) had 5.2 percent of the population and 8.5 percent of all registered nurses in the United States.

The RN-to-population ratio, as it changes over time, also gives insight into the relative changes and consistencies in the nurse supply situation. The five States with the highest ratios remained the same in 1963, 1966, and 1972. Of the nine States with the lowest ratios, eight were the same in all 3 years. Of the five States with the largest percentage increases in the nurse/population ratios from 1963 to 1972, none are in the group with the highest ratios, but three are among eight which consistently had the lowest ratios. Likewise, of the nine States with the lowest increases from 1966 to 1972, none are in the group with the lowest ratios, one is in the group with the highest ratios, and the remainder are scattered around or below the average for all States.

Table 6.--Ratios of employed registered nurses to 100,000 population among the States, 1963, 1966, and 1972

RNs per 100,000 population	Number of States		
	1963 1/2/	1966 3/	1972 4/
0 - 50	-	-	-
50 - 100	-	-	-
100 - 150	2	1	-
150 - 200	7	8	1
200 - 250	9	6	6
250 - 300	9	9	6
300 - 350	10	8	7
350 - 400	7	8	8
400 - 450	2	7	8
450 - 500	1	1	7
500 - 550	2	3	3
550 - 600	-	-	2
600 - 650	-	-	3
650 - 700	-	-	-
700 - 750	-	-	-
750 - 800	-	-	-
800 - 850	-	-	-
850 - 900	-	-	-
900 - 950	-	-	-
950 - 1000	-	-	-
1000 - 1050	-	-	-
Average of State ratios	299	313	389

1/ The 1962 Inventory of Registered Nurses is actually dominated by data of nurses licensed in 1963; it is therefore referenced here as 1963.

2/ Population data are taken from census estimates for July 1 of the stated year.

3/ Ratios for 1972 are based on estimates of employed nurses at the beginning of the year and on the 1972 Inventory of Registered Nurses.

4/ Population estimates are based on U.S. Department of Commerce, Bureau of Economic Analysis, OBERS Population Projections, Series E, April 1974.

In table 7 the distribution of projected State ratios is shown for the years 1976 and 1980. These data are based on the State projections of nurse supply described earlier in this report and on State population projections.7/ The State-by-State ratios appear in table II-3 of appendix II.

Table 7.--Ratios of employed registered nurses to 100,000 population for the States, 1976 and 1980

RNs per 100,000 population	Number of States	
	1976 1/2/	1980 1/2/3/
0 - 50	-	-
50 - 100	-	-
100 - 150	-	-
150 - 200	-	-
200 - 250	-	-
250 - 300	2	-
300 - 350	8	-
350 - 400	8	2
400 - 450	6	11
450 - 500	7	4
500 - 550	4	6
550 - 600	6	6
600 - 650	6	7
650 - 700	-	7
700 - 750	2	1
750 - 800	1	1
800 - 850	1	-
850 - 900	-	2
900 - 950	-	1
950 - 1000	-	-
Average of State ratios	480	547

1/ Based upon projections of the State supplies of registered nurses described earlier in this report.

2/ See footnote 4 of table 6.

3/ The State of Alaska and the District of Columbia are not included here because their projections are extremely volatile due to mobility and, in the case of Alaska, population instability.

7/ See footnote 4 of table 6.

Figure 3.--Average annual percent increase in ratio of registered nurses per 100,000 population 1976-1980

29

In 1976, the data indicate that there are 10 States with ratios in the 250 to 350 strata and 4 States in the 650 to 850 strata. These States comprise 28 percent of the States and have approximately 22 percent of the population and 19 percent of all registered nurses in the United States. Those States in the lower strata (20 percent of all the States) have approximately 19 percent of the population and 13 percent of all registered nurses in the United States. Those States in the upper strata (8 percent of all the States) have approximately 4 percent of the population and nearly 6 percent of all registered nurses in the United States.

By 1980, there will be 13 States with ratios in the 350 to 450 strata and 6 States in the 700 to 950 strata. These States comprise 38 percent of the States and will have approximately 39 percent of the population and 34 percent of all registered nurses in the United States. Those States in the lower strata (26 percent of all the States) will have approximately 35 percent of the population and over 27 percent of all registered nurses in the United States. Those States in the upper strata (11 percent of all the States) will have slightly over 4 percent of the population, but nearly 7 percent of all registered nurses in the United States. (See figure 3.)

Of the five States with the highest RN-to-population ratio in 1976, four of those are projected to be among the five States with the highest ratios in 1980, while only one is among the five States with the highest annual percentage increases in their ratios. Of the five States with the lowest RN-to-population ratios in 1976, three are projected to be among the five States with the lowest ratios in 1980. None of these three, however, are among those five States having the lowest average annual percent increases in the nurse-population ratios between 1976 and 1980. Indeed, one of these three is among the States having the highest percentage increases. (See figure 4.)

The data describing licensed practical and vocational nurses present a somewhat similar picture in terms of the characteristics of the distributions found by stratifying the LPN/LVN-to-population ratios (table 8). Since the supply of these nurses is less than half the supply of registered nurses, the stratification ranges are proportionately reduced. Similar to the registered nurse ratios, the range from highest to lowest is about three times, although this spread narrows as the projections are carried forward in time. The similarities between the registered nurses data and the practical nurses data should not obscure the fact that the States that occupy the lower and upper strata in the registered nurse distributions are, in general, not the same States that occupy similar positions in the practical nurse distributions. Table II-6 in appendix II contains the State-by-State LPN/LVN-to-population ratios for 1974 and 1980.

Of the five States with the highest LPN/LVN-to-population ratios in 1974, three of those are projected to be among the five States with the highest ratios in 1980, but none of those three are among the five States having the highest annual percent increases in their ratios. Of the five States with the lowest LPN/LVN-to-population ratios in 1974, four are projected to be among the five States with the lowest ratios in 1980, but none of those four is among those five States having the lowest annual percent increases in their ratios.

Table 8.--Ratios of employed licensed practical/vocational nurses to 100,000 population for the States, 1967, 1974, 1976, and 1980

LPNs/LVNs per 100,000 population	Number of States			
	1967 1/	1974 2/3/	1976 3/4/	1980 3/4/
0 - 25	-	-	-	-
25 - 50	-	-	-	-
50 - 75	3	-	-	-
75 - 100	12	-	-	-
100 - 125	10	-	-	-
125 - 150	13	4	-	-
150 - 175	3	6	6	1
175 - 200	4	9	6	6
200 - 225	3	14	15	9
225 - 250	2	7	7	10
250 - 275	1	4	7	4
275 - 300	-	1	5	2
300 - 325	-	4	1	6
325 - 350	-	1	4	7
350 - 375	-	-	-	2
375 - 400	-	-	-	3
Average of State ratios	130	218	239	271

1/ Based on the 1967 Inventory of LPNs/LVNs.
2/ Based on preliminary data from the 1974 Inventory of LPNs/LVNs.
3/ See footnote 4 of table 6.
4/ Supply of LPNs/LVNs projected by procedures described earlier.

Figure 4.--Average annual percent increase in ratio of licensed practical nurses per 100,000 population 1974-1980

Median = 4.2%

Distribution of Nurses Within States

A special project has been started by Information and Communication Applications, Inc., under contract with the Division of Nursing, to develop methodology to analyze in-depth the geographic distribution of registered nurses. Known as the assessment of nursing service and resource distribution model, and described in appendix I, it will provide data on within-State distribution of nursing personnel and services for the second annual report. In this report, as an example, the model's application to data from the State of North Carolina will be presented.

The model is designed to consider the fact that the distribution of nursing personnel within each State requires that not only the geographic distribution of such nurses on the basis of location of employment be considered, but the distribution of the health care services from those locations and provided by those nurses must also be examined. The geopolitical unit utilized for analyzing intrastate manpower distribution has traditionally been the county. More recently, Health Service Areas established under the National Health Planning and Resources Development Act of 1974 (Public Law 93-641), are being examined for the purpose of determining manpower distribution. However, Health Service Areas have also been designed with the county as the basic geographic unit.

That the distribution of registered nurses on the basis of location of employment exhibits a great deal of intrastate variability is demonstrated by table 9.

On the basis of county of employment, North Carolina has 5 counties whose full-time equivalent registered nurse per 100,000 resident population ratio is less than 50 and, at the other extreme, 2 counties whose RN-to-population ratio is over 600--a range of more than 1 to 12.

When the actual distribution of nursing services is considered, however, the picture changes significantly. The reason such changes occur is that, for either administrative purposes or preference by the served population, individuals traverse county boundaries (and any other type of boundary, for that matter) to obtain health care and thus nursing services. When these two causes of intercounty transfer of served populations (and therefore nursing services) are analytically considered, an effective ratio of registered nurses to population is derived which more closely represents the registered nurses who actually serve the population of a given county.

The variability of the county ratios is seen in table 9 to be less marked with the inclusion of factors describing intercounty movement of the served population. However, these RN-to-population ratios still extend from 50-99 to 400-499 full-time equivalent registered nurses per

100,000 population served, roughly a range of 1 to 8. Ten counties (10 percent of all counties in North Carolina), containing 6.3 percent of the State's population, are found to occupy these extremes. Further, the 9 counties which are in the 50-99 full-time equivalent RN-to-population ratio, while including 9 percent of the State's counties, have only 2.1 percent of its population.

Table 9.--Distribution of ratios of full-time equivalent registered nurses per 100,000 population, for counties in North Carolina, 1972

FTE RNs per 100,000 population	Number of counties	
	Calculated on the basis of population in location of employment	Calculated on the basis of intercounty movement of served populations
0 - 49	7	-
50 - 99	14	9
100 - 149	16	20
150 - 199	22	31
200 - 249	12	13
250 - 299	8	14
300 - 349	9	6
350 - 399	4	6
400 - 449	4	1
450 - 499	2	-
500 - 549	-	-
550 - 599	-	-
600 - 649	1	-
650 - 699	-	-
700 - 749	1	-
Total	100	100

In brief, then, although there is less variation of registered nurses from county to county when the served population is considered, numerous differences among counties still exist. Further analysis of these differences will be pursued in subsequent annual reports with emphasis on approaches to determining those areas within States that are oversupplied or undersupplied, or that have an adequate supply of such nurses in relation to the population of the area.

Requirements

Section 951(a)(1)(C) of Public Law 94-63 requests information on present and future requirements for nursing personnel, nationally and for each State. The Division of Nursing has regularly prepared national nursing requirements estimates which have been published in various editions of the Health Manpower Source Book: Nursing Personnel. The methodology for the preparation of these estimates has been based on procedures developed by the Surgeon General's Consultant Group on Nursing in 1962.8/ Described in chapter VII of the December 1974 edition of the Source Book,9/ the methodology is based on the concept of determining nursing needs to achieve an optimal level of nursing care. Past applications of this methodology have produced reliable indicators of national nursing requirements. The estimates derived from this methodology compared favorably with alternative estimates based on projections of economic demand which had been derived from other sources. While over the years some refinements have been made in the approach to take account of certain changes, the basic methodology and its underlying concepts had not received any intensive review since their initial implementation. Furthermore, there is need today to take into account a variety of new and potentially innovative approaches to the delivery of health care and the nurse's impact on the system.

A uniform set of data on State nursing requirements has not been available in the past, nor has any methodology existed in the past to produce such data. Fragmentary data on requirements are available from State studies of nursing resources and requirements that have been conducted at various times over the years for the purpose of planning for nursing education and services. However, these data are based on different methodologies, refer to different time periods, and exist only in those States that have undertaken planning activities.

Recognizing the need for refinement and review of requirement projection methodologies prior to the enactment of Public Law 95-63, the Division of Nursing launched four studies concerned with the projection of nursing resources and requirements. Since requirements can be approached from several points of view (e.g., demands, needs, or wants) it was important to examine a variety of approaches. Those chosen use techniques from the areas of econometric modeling, operations research, and public policy analysis. They also are geared toward varying levels of geographic specificity.

8/ Toward Quality in Nursing: Needs and Goals. Report of the Surgeon General's Consultant Group on Nursing. PHS Pub. No. 992, Division of Nursing, Public Health Service, DHEW, February 1963.

9/ Source Book: Nursing Personnel. DHEW Pub. No. (HRA) 75-43, Division of Nursing, Health Resources Administration, December 1974.

In order to be responsive to the nurse requirements data requested under Section 951, a plan was developed after passage of the legislation to direct the output of these studies to produce State-by-State data on nursing requirements and to provide new approaches to the determination of national estimates that would supplement existing methods. These studies will be completed in the next few months, too late for inclusion in this report. Final results of these studies in terms of their findings and implications will be analyzed in the second annual report. Inasmuch as the basic assumptions and methodologies used to arrive at determinations of requirements are critical to the actual estimates made, the analysis of the impact of a range of approaches provides an appropriate framework in which to view requirements.

Appendix I contains descriptions of the methodologies of the four studies, particularly as they pertain to the projection of nursing requirements. A brief summary of the method and purpose of these studies follows:

1. A Model of National Supply and Requirements for Nursing Personnel. (Pugh-Roberts Associates, Inc.)
   This effort is directed from a national perspective toward the analysis of factors affecting nursing requirements and resources from the present through the year 1990. The technique used for the development of this model, known as System Dynamics, describes a set of causal relationships responsible for changes in pertinent variables. As part of this approach, a series of issues of particular relevance to the questions surrounding supply and requirements is being developed. These will be used in the overall analysis of impacts on supply and requirements, particularly from a long-range viewpoint.

2. An Analysis of the Impact of Nurse Manpower Requirements on Changes in the National Health Care System. (Vector Research, Inc.)
   This work was directed toward the assessment of the impact of three anticipated changes in the health care system on the requirements for nurses: (1) the introduction of national health insurance; (2) the increased enrollment in health maintenance organizations; and (3) the reformulation of nursing roles. The model predicts requirements for nurses under various alternative assumptions surrounding these subjects with one developed as "most probably." Projections are based on a 10-year time frame. The first analysis level is on a national basis with subsequent application of the approach to the State level.

3. Analysis and Planning for Improved Distribution of Nursing Personnel and Services: State Model. (Western Interstate Commission for Higher Education)
This effort is being directed toward the systematic use of data available on a national basis, but capable of being disaggregated to State and county levels, to determine nursing resources and requirements. The approach being designed is one that would allow for practical application at the State level. Projections will be made for a 5-year period since that time frame is best suited to a trend approach. Since this activity is most specifically directed to the State level, it will form the basis of the first-level analysis on the numbers of nurses available and the numbers required in each State. The impact of these individual State data nationally will be examined through the application of uniform criteria in each State. Since the areas that are being addressed in this activity are particularly relevant to overall health planning as well as to nurse requirements, this will be incorporated into the overall analysis to provide additional insight into the effects of the delivery system on nurse requirements.

4. Micro-Model for Nursing Manpower Needs. (CSF, Ltd.)
The model is intended to incorporate demand and supply factors into a framework for determining nursing manpower requirements on a sub-State level. It will have a capability for annual requirements projections over a 10-year period. The model incorporates three submodels: health services utilization, nursing manpower demand, and nursing manpower supply. It will take into account registered nurses, licensed practical nurses, and nursing aides/attendants/orderlies. The supply model will be on a county level and requirements will be developed on an institutional and county level.

These modeling efforts will not only serve the important purpose of furthering the analytical capability for this series of reports, but will have wider application. In the development of approaches and in the consideration of outcomes, particular attention has been paid to the need for effective tools at other levels. Thus, it is anticipated that, in addition to the actual generation of requirements estimates from a Federal viewpoint, the processes will be developed in a way that could provide material appropriate for consideration by States and the newly developing Health System Agencies in their planning.

Educational Requirements for Registered Nurses

The adequacy of nursing personnel resources depends not only on the number of those employed, but also on the types and backgrounds of the personnel. In the registered nurse category, the level of educational attainment has been identified as an important variable in determining whether the resources are adequate for the requirements for such personnel. While projections of requirements for nursing personnel are being postponed until the full results of the various projects mentioned previously could be analyzed, some preliminary analysis of the impact of educational requirements is presented here in order to be as responsive as possible to the congressional mandate. These data are based on criteria previously established in 1962.

In 1962, the Surgeon General's Consultant Group on Nursing, charged with the responsibility for determining needs for nursing and recommending a program for accomplishing the goals arising out of those needs, recognized this obligation by including in the criteria against which they measured the needs for nursing, criteria for the appropriate educational attainment level for registered nurses serving in various capacities within the nursing field. These criteria have been widely accepted in the nursing profession. Because of increased nursing responsibilities since 1962, however, they are today considered minimal criteria.

The Western Interstate Commission for Higher Education, as part of its work on the project "Analysis and Planning for Improved Distribution of Nursing Personnel and Services," which they are conducting under contract with the Division of Nursing and which is described briefly earlier in this report, tested the extent to which the Consultant Group's educational criteria have been met in the 1970's. In this test they utilized the Consultant Group's criteria as outlined in the previously mentioned Source Book to determine what, given the current utilization pattern of registered nurses, the appropriate educational mix should be (See figure 5). The data on the way in which nurses are employed was taken from the 1972 inventory of registered nurses, the latest available comprehensive data on the registered nurse supply.10/ The results of this analysis revealed that in 1972, 24,200, or 3 percent of employed registered nurses actually held master's or doctoral degrees, and 107,200, or 13.7 percent, had earned baccalaureate degrees. If the educational preparation of the employed registered nurse population in 1972 was at the levels indicated by the educational criteria for the positions that were filled, 17 percent of the employed nurses would be at the master's or doctoral level and 31 percent at the baccalaureate level. Thus, given the actual distribution of employed nurses according to educational preparation in 1972, there should have been more than five times as many nurses with master's or doctoral degrees as there actually were in 1972, and the number of registered nurses with baccalaureates should have been more than twice the number there were.

10/ Roth, A. and Walden, A., The Nation's Nurses. 1972 Inventory of Registered Nurses, American Nurses' Association, 1975.

Figure 5.--Criteria of preparation for registered nursing positions

Position and field of employment	Educational preparation
Deans of collegiate programs, faculty of graduate programs, research investigators, and nursing service directors of large hospital systems or health agency systems	Doctorate
Teachers in all nursing education programs	Master's
Directors and assistant directors of nursing service in hospitals, related institutions, and health agencies	Master's
Inservice education directors, supervisors, clinical specialists, and consultants in all types of institutions and health agencies or services	Master's
Head nurses, team leaders, public health and school nurses, and occupational health nurses at staff level	Baccalaureate
Directors of nursing service in nursing homes giving "skilled nursing care"	Baccalaureate
Registered nurses in other staff positions, in doctor's offices, or engaged in private duty	Diploma or Associate degree

Source: Source Book: Nursing Personnel. DHEW Pub. No. (HRA) 75-43, Division of Nursing, Health Resources Administration, December 1974, p. 214.

The Western Interstate Commission for Higher Education also examined the distribution of nurses according to educational level in each State in relation to the educational requirements derived from the application of the criteria established by the Surgeon General's Consultant Group on Nursing. The same distribution was made for each State as was made for the overall national utilization patterns in 1972, except that the varying State patterns were taken into account in the generation of the data.

In all instances, when the requirements estimates derived for 1972 were compared with the State's actual distribution of nurses by educational preparation in 1972, none of the States had the number of baccalaureate-, master's-, or doctorally-prepared nurses that these requirements would indicate they should have. The following table indicates the percentage increase in the number of baccalaureate prepared nurses that would be required in the State over the number actually employed, given the way in which nurses were employed in 1972:

Table 10.--Percent increase required in baccalaureate prepared nurses, to meet educational criteria, 1972

Percent increase required	Number of States
Under 50	7
50 to 100	9
100 to 200	25
200 to 300	9
300 and above	1

With the exception of the District of Columbia, the jurisdictions that were among the seven to come closest to meeting the baccalaureate level requirement were in the western part of the country.

At the master's and doctoral level, the disparity in the numbers in the supply in 1972 and the numbers required was considerably wider. In only one jurisdiction, the District of Columbia, was the number required less than 200 percent above the number actually employed in 1972. Nine States needed more than ten times more nurses at that educational level than were in the supply.

Nurse Practitioners

Nurse practitioners are registered nurses whose additional preparation has equipped them for expanded functions in nursing and in the diagnostic and treatment needs of patients. Because they are an integral part of the nursing work force, information about the supply, distribution, and requirements of nurse practitioners is included together with all other types of nurses in this report. However, in this section, certain information about this group of nurses has been isolated in order to respond to the specific requests detailed in Part D, Section 951 of the legislation.

Investigation of the role of nurses to function in an expanded role began in the 1950's. As a result of these early studies, the Federal Government has, over time, supported selected training projects, as well as research, to examine the effect which primary care nursing can have on the health status of individuals and families. There is growing evidence both of the potential of nurses so prepared to increase patient access to the health care delivery system and of public acceptance of the role.

Since training programs began as demonstrations and were targeted to special purposes, there were many variations in curricula, criteria for selection of students, and ways of functioning in employment settings. Much of the information that has been collected is descriptive rather than quantifiable. Future Federal investment in such training dictates the need to obtain baseline information about what has already been accomplished. For this reason, the Division of Nursing entered into a contract with the Research Foundation, State University of Buffalo. The purpose of the project is to provide data to evaluate progr[illegible] preparing nurse practitioners in expanded specialty roles and to analyze d[illegible]erences in positions, functions, and job locations of graduates of [illegible]ese programs in relation to characteristics of the programs, practiti[illegible]rs, and employment settings. For the purposes of this longitudinal study, nurse practitioner is defined as a nurse whose education extends beyond licensure as a registered nurse and is purposely planned to prepare for expanded functions in the diagnostic and treatment needs of patients.

The study is being conducted in two phases. Phase I, dealing primarily with supply, has been completed and has provided the following collected data:

1. The number and type of nurse practitioner educational programs in existence as of January 1, 1974, offering a formal curriculum preparing registered nurses for primary care;

2. Program characteristics including entrance requirements, length of program, curriculum content, types of faculty, and degree of responsibility for which graduates are prepared; and

3. Student variables including prior background and preparation, previous work experience and income, function and satisfaction in previous nursing role, motivation to enter a nurse practitioner program, and expectation of that role upon completion of the program.

Phase II, which is in progress, will provide information on the role and functions of nurse practitioners throughout the country, the adequacy and appropriateness of their preparation in relation to opportunities in the practice setting, and expectations of employers and their relative contributions to the primary care services particularly in medically disadvantaged areas. Data collected in Phase II will be presented in subsequent reports.

The descriptive information on nurse practitioner training programs and on students in those programs is derived from the first phase of the study. As of January 1, 1974, 133 nurse practitioner programs having a formal curriculum were identified. Of the 131 which supplied information, 45 offered advanced academic preparation leading to a master's degree and 86 offered a curriculum leading to the award of a certificate. Programs leading to a master's degree require longer to complete (an average of 15.3 months) than those awarding a certificate (an average of 8.4 months), because the master's curriculum prepares students in research methodology for application in future practice. More than a third of all programs (38.2 percent) offered specialty training in pediatrics, the first of the clinical areas to pioneer in practitioner training. Specialization in family health ranked second in the number of programs, with adult health, maternity, midwifery, and psychiatry following in descending order (table 11). Although there was a rather even geographic distribution of the total number of programs, concentrations by specialty area or by type of program existed among the four regions.

Table 11.--Nurse practitioner programs, by specialty and type of program

Specialty	Type of program					
	Certificate		Master's		Total	
	Number	Percent	Number	Percent	Number	Percent
Pediatric	42	48.8	8	17.8	50	38.2
Midwifery	5	5.8	6	13.3	11	8.4
Maternity	7	8.1	7	15.5	14	10.7
Family	17	19.8	12	26.7	29	22.1
Adult	15	17.5	8	17.8	23	17.6
Psychiatric	--	--	4	8.9	4	3.0
Total	86	100.0	45	100.0	131	100.0

In keeping with the belief that the nursing care of patients who are not acutely ill will move into community and ambulatory care settings, supervised clinical practice in nurse practitioner programs is provided in settings rich with opportunities for learning assessment skills, providing continuity of care over time, providing health teaching and counseling, and working collaboratively with health professionals and community agencies. Accordingly, by far the largest proportion of supervised clinical practice provided in both certificate and master's programs was provided in settings with inadequate access to health care services. Experience in inner-city locations was provided by between 45 percent and 51 percent of the two types of programs, and an additional 40 percent used a combination of rural and inner-city experience (table 12).

Table 12.--Nurse practitioner programs, by availability of inner-city and/or rural practice setting and type of program

Practice setting available	Type of program			
	Certificate		Master's	
	Number	Percent	Number	Percent
Inner city	39	45.3	23	51.1
Rural	5	5.8	3	6.7
Inner city and rural	36	41.9	18	40.0
Neither 1/	6	7.0	1	2.2
Total	86	100.0	45	100.0

1/ "Neither" was not specified

The number of individuals admitted to and graduated from nurse practitioner training programs has increased over time. Table 13 documents that steady increase in both certificate and master's programs over the 5-year period 1970-74. It is also significant to note that the capacity of programs has been increased so that greater numbers of students can be admitted and graduated. By the end of 1974, approximately 4,500 nurses had completed practitioner training, and by 1976, this number will have grown to between 6,000 and 7,000.

Table 13.--Nurse practitioner students admitted and graduated per year, 1970-1974, by type of program

Year	Number of programs	Number of students and type of program: Total admitted	Average admitted	Total graduated	Average graduated
		Certificate			
1970	18	201	11	174	10
1971	29	363	13	289	10
1972	66	806	12	645	10
1973	86	1,369	16	1,134	13
1974	1/ 86	2/ 1,449	17	2/ 1,192	14
Total	--	4,188	--	3,434	--
		Master's			
1970	18	114	6	75	4
1971	24	195	8	117	5
1972	36	267	7	187	5
1973	45	360	8	239	5
1974	1/ 45	2/ 532	12	2/ 311	7
Total	--	1,468	--	929	-

1/ The number of programs is identical for 1973 and 1974 because study data do not include programs initiated after January 1974.

2/ Program directors may have estimated the number of admissions and graduates for 1974.

The demographic and professional characteristics of the students are described in tables 14 and 15. Although there are some differences in the characteristics of students selecting programs leading to a certificate as opposed to those choosing programs leading to a master's degree, the characteristics which they have in common deserve particular attention. The median age of nurses enrolled in practitioner training programs was over 30 and practitioner training followed 5 to 8 years of professional practice, primarily in hospitals. In response to a question asking what influences them to undertake practitioner training, the three most important factors listed were: the opportunity to exert a greater influence on patient care, interest in learning additional skills, and the challenge of the work. Increased salary and status and the opportunity for collaboration with physicians were ranked as the three least important influences on their decision to undertake practitioner training.

Table 14.--Nurse practitioner students, by selected demographic characteristics and type of program

Demographic characteristics	Type of program					
	Certificate		Master's		Total	
	Number	Percent	Number	Percent	Number	Percent
Sex						
Male	16	2.0	6	2.0	22	2.0
Female	778	98.0	301	98.0	1,079	98.0
Total	794	100.0	307	100.0	1,101	100.0
Race						
White	695	88.4	286	93.8	981	89.9
Black	65	8.3	10	3.3	75	6.9
Other 1/	26	3.3	9	2.9	35	3.2
Total 2/	786	100.0	305	100.0	1,091	100.0
Marital Status						
Unmarried	337	43.0	148	49.2	485	44.7
Married	446	57.0	153	50.8	599	55.3
Total 3/	783	100.0	301	100.0	1,084	100.0
Age (in years)						
<25	29	4.0	4	1.5	33	3.3
25-34	355	49.5	174	63.7	529	53.4
35-44	176	24.5	83	30.4	259	26.2
45-54	128	17.8	11	4.0	139	14.0
>54	30	4.2	1	.4	31	3.1
Total 4/	718	100.0	273	100.0	991	100.0
Average	36.2		32.5		35.2	
Median	33		31		33	

1/ "Other" includes oriental, American Indian, Mexican American, Puerto Rican, and Latin American.

2/ Eight certificate and two master's students did not supply information on race.

3/ Eleven certificate and six master's students did not supply information on marital status.

4/ Seventy-six certificate and 34 master's students did not supply information on age.

Table 15.--Nurse practitioner students, by selected professional characteristics and type of program

Professional characteristics	Type of program					
	Certificate		Master's		Total	
	Number	Percent	Number	Percent	Number	Percent
ANA membership						
Member	309	39.1	189	61.8	498	45.4
Nonmember	481	60.9	117	38.2	598	54.6
Total[1/]	790	100.0	306	100.0	1,096	100.0
Years in professional nursing						
0	23	2.9	4	1.3	27	2.5
1-5	233	29.7	159	51.8	392	35.9
6-10	228	29.1	72	23.4	300	27.5
11-15	118	15.1	48	15.6	166	15.2
16-20	96	12.2	18	5.9	114	10.5
>20	86	11.0	6	2.0	92	8.4
Total[2/]	784	100.0	307	100.0	1,091	100.0
Average	10.3		7.0		9.4	
Median	8		5		7	
Prior nursing preparation						
Hospital diploma	370	46.7	11	3.6	381	34.7
Associate degree	70	8.8	2	.6	72	6.5
Baccalaureate	299	37.7	287	93.8	586	53.3
Master's degree	54	6.8	6	2.0	60	5.5
Total[3/]	793	100.0	306	100.0	1,099	100.0
Previous employment setting[4/]						
Hospital outpatient service	92	12.0	19	6.3	111	10.4
Hospital inpatient service	215	28.0	172	57.1	387	36.2
Health center	133	17.3	16	5.3	149	13.9
Extended care facility	16	2.1	2	.7	18	1.7
Fee-for-service physician	54	7.0	1	.3	55	5.2
Prepaid group practice	12	1.6	---	---	12	1.1
Community/home health agency	148	19.3	40	13.3	188	17.6
School	53	6.9	8	2.7	61	5.7
Teaching	25	3.2	35	11.6	60	5.6
Other[5/]	20	2.6	8	2.7	28	2.6
Total[6/]	768	100.0	301	100.0	1,069	100.0

1/ Four certificate and one master's student did not supply information on American Nurses' Association (ANA) membership.
2/ Ten certificate students did not supply information on the number of years in professional nursing.
3/ One certificate and one master's student did not supply information on prior nursing preparation.
4/ Twenty-three certificate and four master's students had not been previously employed.
5/ "Other" included settings within State and Federal agencies including the armed services, inservice education, and social agencies, as well as combined inpatient/outpatient settings.

Distribution

Phase II of the longitudinal study, as described earlier, will produce more definitive information about location and characteristics of the practice setting. Preliminary data from this phase indicate that the majority of graduate respondents are serving in inner-city and rural areas.

A number of factors can be expected to influence the choice of practice setting. The use of inner cities and rural areas for supervised clinical practice during the student experience seems to be a primary determinant in the choice of practice location. A second important factor is the extent to which the nurse practitioner can effectively utilize her skills. For example, the evolving collaborative relationship between nurses and physicians calls for reformulation of the physician's role as the capabilities of the nurse expand to include certain medically delegated functions. Similarly, in settings where nurse practitioners function together with nurses whose mode of practice is more traditional, effective utilization of their respective skills will require accommodation of roles.

Requirements

The demand for nurse practitioners so far exceeds the number now available that they will be in short supply for the foreseeable future. The requirements will, however, be affected by decisions which must be made concerning reimbursement for services under Medicare and Medicaid. At the present time, the only nurse practitioner services that are reimburseable are those which are medically delegated, and then only where they are performed in the presence of a physician. This policy is a deterrent to full and proper use of nurse practitioner skills. It will discourage the use of nurse practitioners in underserved areas, such as satellite clinics where full-time medical services are unavailable. In addition, employers will not be able to provide services for which they cannot be reimbursed. As a consequence, access to the health care delivery system will be denied to the very people whom nurse practitioners are best prepared to serve.

Part II

NURSING RESOURCES
[SECTION 951(a)(2)(A-F)]

Section 951(a)(2) of Public Law 94-63 requires the surveying and gathering of data on the nurse supply, including types of employment and location of practice, those working full time or part time and those not working, the numbers with graduate degrees or advanced training and those in various specialty areas, and the average rates of compensation. It also requires an accounting of the number of nurses entering this country from other nations.

A continual series of data from which this information can be derived is not available at the present time. Moreover, the complexity of the data requirements necessitates the amalgamation of information from a variety of data sources. The findings presented here represent a description of the data appearing in the latest studies which are of particular importance to the determination of nursing resources and requirements and incorporate the areas of inquiry directly specified in this section of the Act. Selected tabular material from the studies which provide background data for the specified areas appear in appendix II and a bibliography of the studies incorporated into this part of the report appears at the end of part II.

The findings are presented in several broad categories: the total nursing group, including those active and inactive and, if active, those on a full- or part-time basis; the employment distribution of the nursing personnel including data currently available on nurses in specialized areas; the number of nurses with advanced training or graduate degrees; average compensation of nursing personnel; and the foreign-trained nurses. These preceding categories were developed from the outline provided in Section 951(a)(2). Because of the widespread interest in the impact of minority groups on registered nursing resources and the specific inclusion of provisions concerning minorities in the Nurse Training Act of 1975, a category pertaining to the distribution of minorities in the registered nurse population is also included.

The Total Nursing Group

The Registered Nurse Complement

The 1972 inventory of registered nurses, conducted by the American Nurses' Association with partial financial support from the Division of Nursing, contains the latest, comprehensive, State-by-State data on nurses holding licenses to practice. The inventories are census studies of nurses with current licenses to practice. The data are gathered through

the respective State boards of nursing that issue licenses to practice in the State, at the time the State is issuing licenses for a particular renewal period. Because a State's licensees include nurses who are not located in that State, and the State's total complement of nurses includes nurses not licensed in the State (although licensed elsewhere), the study amalgamates all State licenses, eliminates duplicates from State to State, and generates data on each State's nurse complement by identifying the nurses actually located in the State. Given the varying dates of licensure from State to State, it takes about 2 years to complete the study. The variety of licensing dates also precludes the conduct of the study more often than every 3 to 4 years.

According to the data in the 1972 study, it was estimated that 70.5 percent of the 1,127,657 nurses with licenses to practice were employed in nursing at the time. Of the nurses who actually reported their employment status, 64.9 percent were employed full time, 30.6 percent were employed on a part-time basis and 4.5 percent did not indicate whether their employment was full time or part time. Differences in these rates from State to State are apparent, however, when a review is made of the data in the study. As the report of the study indicates, the proportion of registered nurses employed in nursing in the States in the Northeastern and Pacific areas of the country generally is less than in other parts of the country:

Table 16.--The percentage of registered nurses employed and not employed in nursing, by area of the country, 1972

Area	Estimated percent active	Estimated percent not active
New England	68.3	31.7
Middle Atlantic	67.1	32.9
South Atlantic	72.2	27.8
East South Central	76.7	23.3
West South Central	72.6	27.4
East North Central	72.7	27.3
West North Central	75.4	24.6
Mountain	71.8	28.2
Pacific	67.5	32.5

Source: Estimated from the 1972 inventory of registered nurses.

The variation in the proportion of those who are employed on a full- or part-time basis is also evident from the data in the study:

Table 17.--The percentage of employed nurses who are full time or part time, by area of the country, 1972

Area	Percent full time	Percent part time	Percent not reporting full time or part time
New England	54.3	41.1	4.6
Middle Atlantic	61.2	34.5	4.3
South Atlantic	67.7	26.0	6.3
East South Central	71.7	20.9	7.4
West South Central	71.6	20.6	7.8
East North Central	68.8	29.2	2.0
West North Central	58.8	36.1	5.1
Mountain	72.1	25.2	2.7
Pacific	66.5	29.1	4.4

Source: 1972 inventory of registered nurses.

Traditionally, comparisons among States and areas have been made on the basis of the numbers of nurses per 100,000 resident population. Utilizing the data from the 1972 inventory of registered nurses in relation to the resident population as of July 1, 1972, estimates of the numbers of registered nurses per 100,000 population were derived for each of the activity status categories. The following table presents these results with the areas of the country ranked according to nurse-to-population ratios:

Table 18.--Ratios of numbers of registered nurses per 100,000 population according to activity status and area of the country, 1972

Area	All employed nurses	Full-time equivalent nurses 1/	Inactive nurses
New England	598	469	277
Middle Atlantic	487	399	239
West North Central	409	332	134
Mountain	398	346	156
East North Central	373	317	140
Pacific	355	301	171
South Atlantic	341	294	132
West South Central	238	212	90
East South Central	235	208	71

1/ Part-time nurse is considered as one-half a full-time nurse.
Source: Derived from 1972 inventory of registered nurses.

As can be seen, the full-time equivalent ratios do not make an appreciable difference in ranking the areas according to the nurses employed. However, they do decrease the difference between the highest and lowest ratios, although the ratio for New England is still more than twice that of the East South Central area.

All of these measures are important in the examination of the nurse supply in a State. If changes in the number of employed nurses are related to increases or decreases in the number of those who would be full time or part time, this affects the actual service being provided to the population. The inactive group, as well, is one that needs to be examined in terms of their potential input into the active nurse supply. In late 1974, the Division of Nursing conducted a study of a sample of nurses from the 1972 inventory of registered nurses. Some of the findings on part-time and inactive nurses from that study are of assistance in providing insights on these groups.

In the 1972 inventory of registered nurses, about 42 percent of the employed female nurses in the 30-39-age category were part time. Nurses in the older-age categories were more likely to be full-time workers, although 28 percent of those who were 40-64 years old were working on a part-time basis.

Being married and having children living at home was an important determinant of part-time status. Fifty-one percent of all the registered nurses covered by the scope of the followup study were married and had children living at home. However, 71 percent of the part-time nurses were in this category in contrast to 55 percent of the inactive nurses and 37 percent of the full-time employed nurses. The nurses in this followup study were asked to select from a list of eight different reasons, the major reason for working on a part-time basis. Not unexpectedly, given the high proportion of married nurses with children among the part-timers, the two reasons which were prominent among the responses were "have to take care of children at home" (43 percent) and "prefer to spend more time at home" (25 percent). Next in order of magnitude was "only way I can get the type of work schedule I want" (9.5 percent). The part-timers were also asked whether they plan to work on a full-time basis at some future date. About 36 percent indicated they would definitely or probably do so; 42 percent replied in the negative and 20 percent were uncertain as to their future plans.

While the 1972 inventory of registered nurses contains information on those nurses who maintain licenses to practice but are not employed as nurses, it does not contain data on the reasons for not working as nurses. In the 1974 followup study, it was estimated that 7.5 percent of the nurses inactive at that time were actively seeking employment in nursing. This group represented only 2.3 percent of the total number of nurses with licenses to practice. A further examination of the group of nurses who were actively seeking employment in nursing revealed that a large proportion came from the ranks of those who not only were apparently previously

inactive in nursing, but were not seeking nursing employment. Seventy-one percent of those actively seeking nursing employment were looking for part-time rather than full-time positions.

About 13 percent of all the nurses who were not employed in nursing in the followup study were estimated to be working in nonnursing positions. These individuals represented only about 4 percent of the total number of nurses with licenses to practice. About 7.5 percent of those who were employed in nonnursing positions were also among those who were actively seeking employment in nursing and 30 percent of them indicated they definitely or probably would return to nursing at a future date. About 14 percent of those who were in nonnursing positions were in health-related occupations.

However, as can be seen from the above data, the bulk of the inactive registered nurses were not looking for nursing positions at this time and were not employed in occupations other than nursing. All of the inactive nurses who were not looking at the time of the study for a nursing position were asked whether they plan to return to nursing at some time in the future. About 17 percent indicated they would definitely return; 23 percent thought they would probably return; 26 percent were uncertain as to their future plans. The proportions indicating some interest in returning to nursing some time in the future declined with the age of the nurse. Also, those who were inactive for a longer period of time were less likely to be interested than were those with a shorter period of inactivity. Inactive nurses with children were far more likely to indicate interest in returning to nursing in the future than were those who did not have children. The majority of all the inactive nurses expressing an interest in nursing employment in the future indicated they would seek a part-time position rather than a full-time one.

The Licensed Practical/Vocational Nurse Complement

The latest comprehensive data on licensed practical/vocational nurses is the 1974 inventory of licensed practical nurses conducted by the American Nurses' Association with partial financial support from the Division of Nursing. The licensed practical nurse/vocational nurse inventories are conducted in the same way as the registered nurse studies. The complete analytical report of that study is not available yet since the data collection and compilation were only completed in the early spring of 1976. Some preliminary findings from the study to be published shortly by the American Nurses' Association are included here.

According to the data in the 1974 study, it was estimated that 76 percent of the 533,459 practical nurses with licenses to practice were employed in nursing. Among those who indicated they were so employed, 73.3 percent were working on a full-time basis, 23.5 percent were part time, and 3.2 percent did not indicate whether they were employed full

time or part time. Of interest in connection with these data is the fact that in the 1967 inventory of licensed practical nurses, 78.5 percent of the 343,635 nurses covered by the study were estimated to be employed. Thus, unlike the data on registered nurses which have shown higher proportions of employed nurses in each succeeding inventory, the licensed practical nurse studies show a slightly lower proportion for 1974 than for 1967. The 1967 study did not contain information on full- or part-time employment.

As was true for registered nurses in 1972, variations are evident from State to State for practical nurses in the 1974 study, in the proportions employed on a full- or part-time basis. Excluding the data for five States in which sizeable proportions of the nurses did not indicate their employment status, the percentage of nurses indicating they were employed in nursing varied from 86.5 percent of those in the District of Columbia to 61 percent of those in Utah. As was the case for registered nurses, the States in the northeastern area of the country generally showed lower proportions of nurses employed in nursing than the States in the southern part of the country. The part-time distribution also seemed to follow a pattern similar to that of the registered nurses.

The large increase in practical nurses in the 1974 study over those in the 1967 study, 55 percent, was accompanied by a changed age distribution. The increase in the number of those under the age of 40 was 87 percent. To a large extent, this probably reflects the sizeable number of graduates from practical nursing schools during the intervening period, almost 250,000. Since there is variation in the proportion of those employed according to the age of the nurse, and also, since the existence of a younger population among those already in the licensed group has implications for a larger potential number of working years, these data have important implications for the analysis of practical nursing resources in the future.

Employment Distribution of Nursing Personnel

In order to obtain a detailed picture of where nursing personnel are located within the health care delivery system and the interaction of one type of nursing personnel with another, a multiplicity of data sources needs to be consulted since no one data collection can provide the type of information necessary for an analysis of this area.

The 1972 inventory of registered nurses and the 1974 inventory of licensed practical nurses provide the latest overall picture of how these two groups of nursing personnel are distributed among the various segments of the system. However, these provide only basic information. An adequate examination of this area requires that a review be made of the relationship between nursing personnel and the population served, as well as the interaction between one major type of nursing personnel and another. To provide

these data, studies are needed of the delivery system itself rather than the individual nursing personnel employed in the system. Therefore, reported here are data from the latest studies available of these various types.

Distribution of Nursing Employment--An Overview

Registered Nurses. The survey on the distribution of employed registered nurses by employment setting, as indicated in the 1972 inventory of registered nurses, showed that most nurses work in hospitals, estimated at 65.2 percent of the total employed complement. About 7 percent were employed in nursing homes and 5 percent were private duty nurses. Private duty nursing by registered nurses is predominantly carried out in institutional settings. Registered nurses providing care for out-of-institution patients comprised 18 percent of the total employed group, with approximately 9 percent in community health and/or school nursing, 7 percent employed in physicians' or dentists' office practices, and 2.5 percent in industrial settings. About 4 percent of the registered nurses were faculty in registered and practical nursing educational programs.

As the information in table II-10 in appendix II shows, although hospitals maintain dominance as the employers of registered nurses, there is considerable variation in these data from State to State. States in the northeastern area of the country tend to have smaller proportions of their nurse supply employed in hospitals than other areas. The New England region showed higher proportions of nurses working in nursing homes than other regions, while the southern area showed lower percentages. The Pacific and Mountain areas of the country were more likely to utilize nurses in physicians' or dentists' offices. For these areas of the country, this field was the second largest in the array of various types of employment settings. The east north-central region of the country has the largest proportion of industrial nurses, reflecting the highly industrialized nature of that region.

The nature of the registered nurse's place within the health care system is such that he or she not only practices in direct patient care positions, but engages in substantial numbers in such areas as administration, supervision, and teaching. The inventory, therefore, also contains data on broad category levels of nursing positions: about 55 percent of employed registered nurses reported themselves in general duty or staff level positions; almost 26 percent were in head nurse or supervisory positions; about 4 percent were in administrative positions; and another 4 percent were teachers. Within each field of nursing this percentage distribution varies.

Since nursing position levels do not necessarily identify the types of activities in which the nurse is engaged, and the types of nursing

positions have been changing, the study that was made in 1974 as a followup to the 1972 inventory of registered nurses contained questions on the broad activities carried out by the nurse during a usual workweek and the position title which the nurse carried.

About 69 percent of the nurses were found in those position titles in which the average percent of time spent in direct patient care predominated over the averages for the other identified categories. Almost 6 percent of the nurses were in position titles in which administration was predominant, while 8 percent were in the category in which supervision was predominant. Teaching predominance was found for 5.5 percent of the nurses. The 1974 followup study no doubt underestimates the percentage of those nurses who spend a considerable amount of their time in direct patient care, since it excludes all new entrants into nursing since 1972. Those first entering nursing are more likely to be found in the types of nursing positions in which direct patient care predominates, while positions in which administration, supervision, and teaching predominate usually are filled by those with more nursing experience.

The survey did not separately identify nurse researchers. However, there were five positions for which it was estimated that 25 percent of the nurses in the position spent time in the research area. These were the clinical nursing specialist, inservice education director or instructor, nursing coordinator, patient care coordinator, and faculty with the title of professor (or assistant/associate). In none of these cases, however, was it estimated that as many as half the nurses in these positions were doing any research during their usual workweek.

No data are available at the present time to adequately identify the numbers of nurses who are nurse clinicians and nurse practitioners. The 1974 followup study did contain some data along these lines. Based on the responses in that study to the question on position title, it was estimated that about 3 percent, or about 21,000 of those covered by the scope of the study, had position titles such as clinical nursing specialist, nurse clinician, or nurse practitioner. However, since this information was obtained through a checklist of position titles rather than a functional description of the position, these data need verification before one can determine the extent of such positions among the employed nurse population.

Licensed Practical Nurses. The 1974 inventory of licensed practical nurses contains information on the distribution of employed practical nurses according to the fields of nursing in which they work. The responses to that survey show that 63 percent of the employed nurses indicated they were working in hospitals and 17 percent in nursing homes. About 9 percent were in areas providing care to noninstitutionalized persons: 2 percent

in public or community health, 6 percent in physicians' or dentists' offices, and 1 percent in industrial settings. About 7 percent reported themselves as working in private duty.

As noted for registered nurses, there are similarly State-by-State variations in the percentage of employed practical nurses working in each field. For licensed practical nurses as for registered nurses, the New England region had the highest proportion of nurses working in nursing homes among all the regions, while the South reflected the lowest. The northeastern area also had lower proportions of licensed practical nurses working in physicians' or dentists' offices than did other areas. The 1974 inventory of licensed practical/vocational nurses does not contain data on position levels for these nurses, since for the most part, they work in staff positions.

Nursing Aides. Unlike registered nurses and licensed practical nurses, these nursing personnel are not covered by licensing procedures through which such surveys as the inventories can be conducted. Data on nursing aides, orderlies, or attendants are, therefore, usually obtained from surveys made of the facilities providing health care. There are also no established educational requirements for positions such as nursing aides, orderlies, or attendants. It has been estimated that over 95 percent of these individuals are employed within the hospital or nursing home component of the health care delivery system. Some discussion of how nursing aides fit within the system is contained in the following material on studies made of specific types of facilities.

Distribution of Nursing Employment Within Health Facilities

Hospitals. As indicated previously, the dominant employer of nursing personnel is, by far, the hospital. The 1972 survey of nursing personnel in American Hospital Association-registered hospitals shows the employment of approximately 530,000 registered nurses, 237,000 licensed practical or vocational nurses, and 544,000 aides, orderlies, and attendants. On a regional basis, some variations in the bedside nursing personnel available per patient each day for 1972 can be seen in the following table:

Table 19.--Ratio of full-time equivalent bedside nursing personnel per 100 patients in hospitals, by region of the country, 1972

Census region	Number of hospitals	Full-time equivalent nursing personnel per 100 patients		
		RNs	LPN/LVNs	Aides, orderlies, attendants
United States	7,035	21.5	16.4	36.9
Northeast	1,274	22.0	13.0	32.4
North Central	1,991	22.6	15.3	40.0
South	2,426	16.0	18.7	39.8
West	1,344	31.9	22.0	35.4

Source: table II-13, appendix II

However, in addition to variation in ratios from area to area and State to State, variations also exist in both the amount of personnel employed and the mix of such personnel according to the type of hospital facility and the size of the facility.

The dominant type of hospital in terms of numbers of both patients and hospitals is the nonfederally operated, short-term general and allied special hospital. In 1972, these hospitals comprised 83 percent of all hospitals and accounted for 57 percent of the patients in hospitals. These hospitals have the highest overall ratio of bedside nursing personnel per 100 daily patients, 99.6 as compared to 74.8 for all hospitals in the country. These hospitals also have a higher level of usage of such personnel as registered and licensed practical nurses. States have from less than 10 to over 500 such hospitals. Their RN-to-patient-day ratios vary from less than 15 to over 115, and their LPN/LVN-to-patient-day ratios vary from slightly over 16 to slightly under 50. However, in the case of several States, those with some of the highest RN-to-patient-day ratios also have high LPN/LVN-to-patient-day ratios, but the reverse is not true. Aides, orderlies, and attendants on an overall basis exhibit somewhat higher personnel-to-patient-day ratios than practical nurses.

Nursing Homes. The 1973 survey of nursing home facilities conducted by the National Center for Health Statistics reported that in the 21,800 nursing homes in the country there were more than 635,000 full-time employees and over 237,000 part-time employees. Among the full-time employees about 41,000 were registered nurses and 56,000 licensed practical nurses. In relation to the number of residents in nursing homes in the country, there were 34 full-time registered nurses and 47 full-time licensed

practical nurses per 1,000 residents. No separate identification is made of the number of nursing aides.

The ratios of full-time registered nurses and practical nurses to 1,000 nursing home residents, while varying from State to State, do not manifest the variation shown in hospital nurse-to-patient-day ratios. The ratio of full-time registered nurses to 1,000 nursing home residents spans the range from 13 to 84, while the ratio of practical nurses to 1,000 nursing home residents covers the range from 20 to 81. States that had ratios of more RNs-per-1,000-residents than the national average are almost evenly divided between those with ratios of LPN/LVNs-per-1,000-residents above the national ratio and those with ratios below the national ratio (14 and 13 States, respectively). Those States with ratios of RNs-per-1,000-residents below the national ratio are also nearly evenly divided between those with ratios of LPN/LVNs-per-1,000-residents that are above or below the national ratio (10 and 14 States, respectively).

The picture on a regional basis shows, in many cases, definitive relationships between ratios of RNs-per-1,000-residents and LPN/LVNs-per-1,000-residents. The Middle Atlantic States have both ratios of RNs-per-1,000-residents and LPN/LVNs-per-1,000-residents that are considerably above the national ratio. The New England, South Atlantic, and Mountain States also show ratios above the national ratios. The East South-Central and West South-Central States have RNs-per-1,000-residents ratios strikingly below the national one, while their LPN/LVNs-per-1,000-residents ratios are noticeably above. The East North-Central States have both ratios which are only somewhat below the national ratio, but the ratios in the West North Central States are considerably below the national ratio. The Pacific States are mixed, not only in their regional ratios, but on an individual State basis, a fact which may result from grouping three noncontiguous geographical areas.

Community Health Nursing Agencies. Data from the Division of Nursing's 1974 community health nursing survey show that in the 11,203 State and local agencies there were 58,976 registered nurses and 4,068 licensed practical/vocational nurses employed. Additionally, there were 16,680 individuals, including home health aides, homemakers, nursing aides and other auxiliary nursing personnel. It is important to point out here that although these individuals serve as assistants to the nursing personnel, their functions may be somewhat different in scope than those of the nursing aides, orderlies, and attendants in inpatient facilities such as hospitals and nursing homes. Local official agencies rank first as the employers with the largest proportion of the community health nurse staff. Boards of Education are most numerous among employers but they rank second in terms of the proportion of community health nurse staff employed.

Nationally there are 25.3 full-time registered nurses employed for community health in State and local agencies for each 100,000 population. However, this ratio varies heavily from State to State with a low of 14.2 nurses per 100,000 population in Illinois to a high of 65.4 in Vermont. This disparity in the distribution of community health nurses is further emphasized by the fact that 11 States have fewer than 20 nurses per 100,000 population, while 10 other States and the District of Columbia have more than 35 nurses per 100,000 population.

Other Areas of Nursing. The data reported earlier present a brief summary of information contained in specific facilities studies which relate the numbers of nursing personnel to patients or populations served. Other areas in which large numbers of nursing personnel provide care to people include physicians' and dentists' office practices and industrial settings. At this time, there are no specialized studies of these areas from which similar data can be derived.

Registered Nurses with Graduate Degrees or Advanced Training

In order to project how many nurses with graduate degrees there are or might be, one has to be aware of the structure of the nursing education system. The type of program in which an individual studied originally might reflect the degree to which the person would seek graduate education and the time it would take to achieve such education.

Earlier parts of this report in which the supply and distribution of registered nurses are discussed provide data on the educational attainment levels of employed registered nurses in the United States and each State. Based on various data sources available, it has been estimated that 24,200 registered nurses, or about 3 percent of the total number of employed registered nurses, held master's or doctoral degrees in 1972. Of importance here is the process whereby these levels of academic preparation have been achieved. The 1974 followup study of the 1972 inventory of registered nurses showed that about 9 percent of diploma graduates and 10 percent of associate degree graduates in the study had subsequently obtained at least the baccalaureate related to their nursing careers. Seventeen percent of baccalaureate graduates had obtained master's or doctorates. The number of individuals participating in the study and the type of response received to some of the questions precluded any definitive analysis of the time it took to obtain the highest degree achieved within nursing since graduation from a basic nursing program. However, an examination of the data leads to an assumption that associate degree and baccalaureate graduates were more likely to have achieved their additional education in a shorter period after graduation from a basic program than were diploma graduates. As might be expected, given the relative recency of most of the graduations from associate degree programs, the majority of the associate degree graduates who indicated having baccalaureates obtained

these within 5 years after their associate degrees. Among the diploma graduates with baccalaureates, this was true for a much smaller proportion. About half of the basic baccalaureate graduates with master's degrees seemed to have obtained these within 5 years after graduation from their baccalaureate programs.

It was estimated that about 9 percent of all the registered nurses in the study were enrolled in formal educational programs leading to an academic degree at the time of the study. About three-quarters were studying for a baccalaureate; the remainder were involved in master's or doctoral level study. About 85 percent of these nurses were employed in nursing at the same time as they were attending school, with 65 percent of all of them working on a full-time basis.

The respondents who indicated that they were actively engaged in studying for an academic degree were also asked to respond to a checklist of possible sources of financing for their study, checking any number of areas that were contributing to the financial support of their education. Given the fact that most of them were working while attending school, it is not unexpected that 63 percent indicated that financial support was coming from their own current earnings. Next in order of frequency of selection was personal savings, checked by 32 percent. About 5 percent indicated they had Federal traineeships, scholarships, or grants. Most of these were studying at the master's or doctoral level.

Of importance also, in considering the number of those with master's or doctoral degrees, is the area of study undertaken by those in graduate programs. In nursing, as in other professional disciplines, preparation for supervision, administration, teaching, and clinical specialization, as well as for highly independent action in the primary care of patients, requires education at the master's or doctoral level. There has been an upward trend in the number of registered nurses taking the advanced preparation necessary for such leadership positions in nursing; the 2,694 master's and 74 doctoral graduates of the 1974-75 academic year represent sizeable increases over earlier times. At the same time, in the master's program area, there has been an increase in the proportion of those graduating with advanced clinical practice preparation. As the latest report of these data from the National League for Nursing indicates, in 1964-65 there were about four graduates from the teaching major for every graduate from the advanced clinical practice major. By 1973-74, graduates with advanced clinical practice majors exceeded graduates from the teaching major by nearly two to one.

Average Compensation of Nursing Personnel

In order to provide data on the average rates of compensation of nursing personnel by type and location of practice, an amalgamation of data from a number of discrete studies is necessary. Various agencies,

Federal and private, are involved in the collection of salary data for nursing personnel. The information presented here includes excerpted data from these varying sources. Table 20 presents a brief summary of the data included in each of these studies. For ease of review, the earnings quotations have been translated to an annual basis where the particular study provided data on other than an annual basis. Tables II-19 through II-28 in appendix II provide tabular presentations of the data on earnings as collected in the individual studies. Following is a summary of the findings in each of the studies.

Hospital Nursing Personnel

Since hospitals are the dominant employer sector for nursing personnel, the salaries reported for that segment reflect salary levels for the major portion of nursing personnel. For this employer group, however, there are no overall data that provide information on salaries for the country as a whole. The Bureau of Labor Statistics of the United States Department of Labor conducts studies of employment conditions in non-Federally operated hospitals in selected metropolitan areas. The latest data were collected in August 1975, in 23 metropolitan areas. Reported here is some preliminary information for these areas. In connection with these data, it is important to note that while these metropolitan areas are diverse according to the area of the country in which they are located, they do represent fairly sizeable population centers. Hospital salary levels differ according to the size of the area in which the hospital is located and the size and type of hospital, with higher salaries paid in larger population centers. Therefore, these data cannot be taken as indicative of general salary levels in all non-Federal hospitals.

In the August 1975 study, average hourly earnings of general duty (staff) nurses ranged from $4.88 in Atlanta, Georgia, to $7.02 in the San Francisco-Oakland metropolitan area. The same survey showed that the average hourly earnings of directors of nursing ranged from $8.10 in the Cleveland, Ohio, metropolitan area to $12.31 in the New York City metropolitan area. Supervisors' earnings showed a range of $6.06 in Dallas to $8.77 in New York City, and those of head nurses ranged from $5.65 in the Houston, Texas, metropolitan area to $8.01 in San Francisco-Oakland. Thus, the New York City metropolitan area reported the highest average hourly earnings for directors of nursing and supervisors, while San Francisco-Oakland had the highest average hourly earnings for general duty and head nurses.

Average annual increases over a 3-year period could be ascertained for 22 of the areas studied. Such increases in earnings of general duty (staff) nurses since August 1972 ranged from 4.4 percent in Atlanta to 11.4 percent in Portland, Oregon. In 12 of the 22 areas, the head nurse and supervisor positions experienced higher average annual percentage increases

Table 20.--Latest data on average compensation of full-time nursing personnel, by field of nursing and type of position

Field of nursing and type of position	Source of data	Date of survey	Coverage	Estimated average annual salary or range of average annual salaries 2/
Hospital 1/	Bureau of Labor Statistics Industry Wage Survey, Hospitals	1975	Non-Federal hospitals in 23 major metropolitan areas	
Nursing aides				$5,554 - $10,213
Licensed practical nurses				7,384 - 11,191
General duty nurses				10,150 - 14,602
Head nurses				11,752 - 16,661
Clinical nurse specialists				12,480 - 17,477
Supervisors				12,605 - 18,054
Directors of nursing				16,848 - 24,005
Nursing Home	Bureau of Labor Statistics Industry Wage Survey Nursing Homes & Related Facilities	1973	Privately owned facilities in 20 major metropolitan areas	
Nursing aides				3,578 - 6,806
Licensed practical nurses				5,824 - 9,165
Registered nurses				7,821 - 11,837
Community Health	NLN, "Salaries in Community Health Services", Nursing Outlook, December 1975	1975	National	
Local Official Agency				
Nurse directors				17,500
Supervising nurses				14,413
Staff nurses				11,495
Nonofficial Agency				
Nurse directors				16,400
Supervising nurses				12,714
Staff nurses				10,148
Board of Education				
Supervising nurses				15,700
Staff nurses				11,605
All Public Health Agencies				
Licensed practical nurses				7,936
Public health assistants				7,382
Home health aides				5,766
Other auxiliary personnel				6,704
Industrial Registered Nurses	Bureau of Labor Statistics, Occupational Earnings in all Metropolitan Areas	1975	All metropolitan areas.	11,466
Office Nurses, R.N.	DHEW, Division of Nursing, Survey of RN's Employed in Physicians' Offices.	1973	National	7,734
Nursing Education, R.N.	ANA, Report on Survey of Salaries of Nursing Faculty and Administrators in Nursing Educational Systems	1973	National	
Baccalaureate programs				12,075
Associate degree programs				12,065
Diploma programs				11,417
Practical nurse programs				11,398

1/ Estimated average annual salary was converted from hourly earnings based on average standard work week in each metropolitan area from 1972 hospital survey, standard 40-hour week was assumed for certain localities and positions not surveyed in 1972.

2/ For the hospital and nursing home fields, this is the range of estimated average salaries among the metropolitan areas covered in the studies.

than did the general duty positions. Average hourly earnings of directors of nursing increased an average annually of 3.9 percent in Buffalo to 11.7 percent in Memphis.

Information on the salaries of nurses employed as clinical specialists in hospitals was sought for the first time by the Bureau of Labor Statistics (BLS) in their 1975 survey. Because of the relatively small size of the group meeting the BLS definition of clinical specialists, and the concentration in particular hospitals, the information was not always sufficient to meet the BLS publication criteria.

For all the clinical specialists in all hospitals covered by the scope of the survey, the average hourly earnings ranged from $6.00 in the Kansas City, Missouri, metropolitan area to $8.73 in the New York City area. Employment seemed to be concentrated in the nongovernmental and short-term hospitals. The highest average rate of hourly earnings ($9.01) appears for clinical specialists in nongovernmental (private) hospitals in the New York City area.

The average hourly earnings of licensed practical nurses reported in the 1975 BLS survey ranged from $3.55 in the Dallas and Houston areas to $5.59 in the New York City area. The average annual percent increase since August 1972, was highest in New York City, 11.3 percent, and lowest in Boston, 5.3 percent.

Nursing aides showed a range of average hourly earnings from $2.67 in the Dallas area to $4.91 in the San Francisco-Oakland area. The New York City area showed the greatest annual rate of increase, 10.7 percent.

Nursing Home Nursing Personnel

A similar type of survey in metropolitan areas to that made in hospitals was conducted in privately owned nursing homes and related facilities by the Bureau of Labor Statistics in 1973. This survey obtained information on the hourly earnings of registered and licensed practical nurses and nursing aides in these facilities.

The average hourly earnings of full-time registered nurses in these facilities ranged from $3.76 in the Denver, Colorado, metropolitan area to $6.07 in the New York City area. Licensed practical nurses employed full-time had hourly earnings of from $2.80 in the Atlanta, Georgia, metropolitan area to $4.70 in the New York City area. The hourly earnings of nursing aides ranged from $1.72 in the Dallas, Texas, area to $3.49 in the New York City area.

Community Health Agency Nursing Personnel

Salaries of registered and licensed practical nurses and other nursing personnel in public health or community health nursing employment are surveyed annually in April by the National League for Nursing. The information is prepared on the basis of the type of employing agency and the type of nursing position. It is published in terms of the median annual salaries.

In local official agencies in 1975, the median annual salary for the nurse director was $17,500 while in nonofficial agencies it was $16,400. Supervising nurses in local official agencies had a median annual salary of $14,413, and in nonofficial agencies it was $12,714. Fully qualified public health nurses in staff positions of local official agencies had a median annual salary of $12,033 while other registered nurses in these positions averaged $10,626. In nonofficial agencies, the fully qualified public health nurse had a median salary of $10,715 and other registered nurses averaged $9,815. The average annual percent increase in salaries for registered nurses in official and nonofficial public agencies during the years 1972-1975 ranged from 4.1 percent to 6.2 percent.

Registered nurses holding positions of supervising nurses employed by Boards of Education earned a median annual salary of $15,700 in 1975 and staff nurses in this employment had median annual salaries of $11,605. The average annual increase in salaries for these nurses in the period 1972-1975 was 4.8 percent for the supervising nurses, and 6.1 percent for the staff nurses.

Information on the salaries of licensed practical nurses showed that in 1975 these nurses had a median annual salary of $7,935, and an estimated annual increase of 6.2 percent for the period 1972-1975.

Salaries of auxiliary nursing personnel in the public health agencies surveyed in 1975 showed median annual salaries of $7,382 for the public health assistant, $5,766 for the home health aide, and $6,704 for other auxiliary personnel.

Registered Nurses Employed in Industrial Settings

The annual community wage surveys of occupational earnings made by the Bureau of Labor Statistics contain data on nonsupervisory registered nurses employed in industrial settings. The national and four geographical area summary information about these nurses' average weekly earnings are shown on table II-25. In 1975, nationwide, these registered nurses had average weekly earnings of $220.50, an estimated annual increase of 10.3 percent over the 1974 average.

Average weekly earnings in 1975 ranged from $210.50 in the South to $235.50 in the West. The highest rate of change among the regions was a 12.1 percent increase in the earnings of the industrial nurses in the West over the 1974 figure for that region.

Registered Nurses Employed in Physicians' Offices

A special study of registered nurses employed in physicians' office practices, conducted for the Division of Nursing in 1973, contained data on the salaries paid to these nurses. That survey showed that in 1973, the average annual salary for those employed on a full-time basis was $7,734 in the country as a whole. The lowest average salary was in the South, $7,191. The highest was in the West, $8,442.

Registered Nurse Faculty Members in Nursing Educational Programs

The salaries of nurses employed as faculty in schools of nursing tend to vary somewhat according to the type of nursing educational program that is offered and the level of academic preparation of the faculty member. In the 1973 survey of salaries of nursing faculty and administrators in nursing educational systems, conducted by the American Nurses' Association, baccalaureate program teaching faculty had a median annual salary of $11,940 while those in diploma programs averaged $11,128. In the baccalaureate programs the median salary for the total faculty, including administrative personnel, was $12,075. For teaching faculty with at least master's degrees, the median salaries ranged from $12,720 in diploma programs to $12,000 for master's and $16,800 for doctoral faculty in baccalaureate programs.

Since the survey form was sent only to those colleges or universities with basic programs preparing students to become registered nurses, a number of registered nurses functioning as faculty in other nursing educational programs would be excluded from these data. In addition to faculty in basic baccalaureate programs in colleges and universities, there are faculty in post-RN nursing educational programs. These persons are included here only if the college or university in which their program is located also contains a basic baccalaureate program.

The median salary for nurses in all positions in associate degree nursing programs was $12,065. In diploma programs, the median salary for nurses in all positions was $11,417. Registered nurses in all positions in practical nurse educational programs earned a median salary of $11,398.

Foreign-Trained Nurses

The Statistics Branch of the United States Immigration and Naturalization Service publishes in its annual reports the number of professional nurses admitted to the United States. They include information on the immigrant or nonimmigrant (temporary resident) status of the nurses and the region and country of their last permanent address.

During the years 1970-1975, there was variation in the total number of nurses admitted to the United States each year. The total for 1970 was 6,093 entrants, with a high of 9,468 for 1973, the total declining to 8,460 in 1975. The category of permanent resident aliens among these nurses reflects the total number admitted, with 4,934 admitted in 1970, 6,335 in 1973, and 6,131 in 1975.

Analysis of the countries of origin of nurses entering the United States as permanent resident aliens indicates a change from earlier years when the largest number came from the European countries and Canada, to a greater number now coming from the Pacific and Asiatic countries. In 1971, 1,230 nurses came from Europe and 1,021 from Canada. In the same year, 2,969 came from Asian countries. Among these, the Philippines contributed 1,549; Korea, 526; and India, 169. In 1975, only 916 nurses came from Europe and 309 from Canada, while 4,183 came from Asian countries. In that year, 1,245 nurses came from the Philippines, 866 from Korea, and 1,289 from India. In 1970 the number of nurses entering the country as nonimmigrants (temporary residents) totaled 1,159. This number increased to 2,329 in 1975 and there was also a change in their status. Whereas in 1970, 1,109 were admitted as exchange visitors with student visas, this number declined to 213 in 1975. The category of those admitted for the purpose of employment in nursing increased from 7 in 1970 to 2,084 in 1975. Again, the greatest proportion of nonimmigrant nurses are coming from the Asian countries. (See tables II 29-31 in appendix II.)

While the visas of this group are for temporary residence, they may be extended almost indefinitely if the holders continue to comply with the conditions of entry. It is known that a large proportion of those admitted as temporary residents seek renewal of their visas until they can adjust their status to that of permanent residents. Many of the nonimmigrant nurses can be expected to become a permanent part of the United States nurse population.

It is not possible to know the true extent of the number of foreign-trained nurses actually in the United States, since no record is kept by the Immigration and Naturalization Service of the movement of these immigrants out of the country and their possible reentry under a different visa category.

A further condition creating a gap in the ability to know the actual number of nurses who may be entering or remaining in the United States, is the possibility for nurses to enter as spouses, parents, or dependents of United States citizens or permanent resident aliens. To enter in this category it is not necessary for the entrant to indicate a profession or occupation or any intention to take employment. Since nurses are predominantly women, it is possible that a number would be entering as dependents without stating their profession as nurses.

A limited survey of visa applications was made in 1976 by the Division of Nursing with the cooperation of the Statistics Branch of the Immigration and Naturalization Service. All visa applications for a selected month, submitted by persons listing themselves as housewives, unemployed, or no occupation, were looked at for information on education and work experience from which one could conclude that the applicant was also a nurse. Among the 4,450 applications scanned, there were 33 possible professional nurses, or 0.7 percent of the total number scanned.

The Immigration and Naturalization Service reports a total of 85,800 persons admitted in 1975 as housewives, as unemployed, or as reporting no occupation. While the result of the limited survey discussed above is very inconclusive, it indicates that there is an additional number of nurses entering the country annually as part of this large group of immigrants.

All nurses, foreign-trained as well as United States-trained, are required to obtain State licenses in order to take employment as nurses. A survey of foreign nurse graduates, carried out for the Division of Nursing by the American Nurses' Association (ANA), reported on the number of State licenses issued to graduates of foreign nursing schools. In the survey years of 1970, 1971, and 1972, the State Boards of Nursing reported licensing a total of 20,485 foreign nurse graduates. For the same period the States reported receiving 43,430 applications for licensure from foreign nurse graduates. While the licenses issued represent individuals, the number of applications are known to contain many duplications due to the mobility of the nurses in seeking licensure. However, the study concluded that a large number of the applicants do not become licensed.

During the ANA survey years, the States reported that of the 20,485 licenses issued, 72 percent were on the basis of endorsement of foreign nursing credentials. This practice has now been almost entirely discontinued by the States, and foreign-trained nurses are now required to take the State licensing examination, (as are all United States-trained nurses). The ANA survey of foreign nurse graduates reported a failure rate of 81.5 percent among those taking the examination the first time. The survey concludes that, after repeated tries, approximately 50 percent of the applicants are successful in obtaining the required license.

The number of applications made and the number of licenses issued also appear to be unrelated to the number of nurses reported entering the country during the survey years, as reported by the Immigration and Naturalization Service. A number of reasons contribute to these discrepancies in addition to that discussed above regarding dependent status. Some nurses may have been in this country for some time but have not applied for licensure because of State laws requiring citizenship. They may now be doing so as this requirement is being deleted from the State Nurse Practice Acts. Other nurses who may have been here as visitor-observers (student status not requiring licensure) may also be applying in anticipation of adjusting their immigration status to that of permanent resident alien.

It can be concluded that approximately 8,000 to 9,000 nurses enter the country annually, that most of them intend to remain here permanently, and that about half of those who remain obtain a license to practice. Also, while not verified at this time through actual studies, it is assumed, based on various sources of information, that even if unlicensed, they are employed in nursing.

In the 1974 followup study to the 1972 inventory of registered nurses, it was found that only about 2 percent of that licensed group had received their basic nursing education outside of the United States.

Registered Nurses with Minority Backgrounds

Early studies were not able to provide information on the racial/ethnic backgrounds of registered nurses because of constraints on the type of data that could be collected. The 1977 inventory of registered nurses which is currently being conducted by the American Nurses' Association under a contract with the National Center for Health Statistics, will incorporate such data to the extent that it is available. However, many of the constraints that existed in the past, which precluded the collection of these data in some States, will also exist during this period so that complete data covering all registered nurses will not be available from that study.

The 1974 followup study to the 1972 inventory of registered nurses did obtain information on the racial/ethnic background of the registered nurses covered by the scope of the study. As indicated previously, this study does not include any nurses who became part of the registered nurse population since 1972; therefore, the data as to the proportion of registered nurses with minority background reflects the nurse population as of 1972. The study estimated that 5 percent of the registered nurses were other than white; 3.3 percent were estimated to be black, and 1.7 percent came from other minority backgrounds.

A separate examination of the data on those with minority racial/ethnic backgrounds was made to determine whether their characteristics differed to any great extent from those of the nurses who were classified as "white Caucasian." It should be remembered throughout this discussion, however, that minority nurses constitute a relatively small proportion of the total number of nurses. Therefore, for each of the areas discussed, they represent only a small segment of the total number of nurses with that particular characteristic.

The northeastern area of the country accounted for almost a third of both the white and minority nurses, but the distribution of the groups among other areas of the country differed. Significantly higher proportions of the minority nurses than of the white nurses were located in the southern and western areas. Together, the South and West contained 49.5 percent of the minority nurses, while 41 percent of the white nurses were in those areas. On the other hand, while one-quarter of the white nurses were in the north-central part of the country, only 17.5 percent of the minority nurses were there.

As was the case for the white nurses, the diploma type of basic nursing education was the most typical route for the minority nurse. However, a larger proportion of minority nurses than white nurses received their basic nursing education in associate degree programs: 8.5 percent of minority nurses as contrasted with 4.7 percent of white nurses. Basic baccalaureate programs accounted for 12 percent of the minority nurses and 10 percent of the white. Minority nurses were more likely to be more recent graduates than were white nurses. About 58 percent of minority nurses had been out of basic nursing school no more than 20 years, while 48 percent of white nurses fell into that category. Taking into account any postbasic education which the nurses may have had, about 19 percent of the minority nurses had baccalaureates and 8 percent, master's degrees.

Minority nurses were much more likely to be in active nursing practice than were white nurses. Only 15 percent of minority nurses were not actively employed in contrast to 31 percent of white nurses. The minority nurses were also much more likely to be full-time workers: 74 percent were employed in nursing on a full-time basis, and 11 percent worked part time.

Employed minority nurses were more likely to work in urban areas. About 85 percent of the employed minority nurses were working in a Standard Metropolitan Statistical Area; about 72 percent of the employed white nurses were working in such areas. While the majority of both groups of nurses were employed in hospitals, on a proportionate basis, minority nurses were less likely than white nurses to be employed in nursing homes or physicians' offices. They were more likely than the white nurses, however, to be employed in public health/community health agencies or schools of nursing.

Bibliography of Data Sources for Part II: Nursing Resources

1. Annual Reports: Immigration and Naturalization Service, 1970-75. U.S. Immigration and Naturalization Service, Department of Justice.

2. Annual Yearly Reviews. Department of Home Health Agencies and Community Health Services, National League for Nursing.

3. Area Wage Surveys, including published and prepublished data. Bureau of Labor Statistics, U.S. Department of Labor.

4. Follow-Up to 1972 Inventory of Registered Nurses, 1974. Division of Nursing, HRA, DHEW, Executive Summary in preparation.

5. Hospitals, August 1972, Industry Wage Survey. Bureau of Labor Statistics, U.S. Department of Labor, Bulletin 1829, 1974, and prepublished data, August 1975.

6. Industry Wage Survey: Nursing Homes and Related Facilities, May 1973. Bureau of Labor Statistics, U.S. Department of Labor, Bulletin 1855, 1975.

7. Inpatient Health Facilities as Reported from the 1973 Master Facility Inventory Survey. 1976. Vital and Health Statistics, Series 14, No. 16, National Center for Health Statistics, HRA, DHEW.

8. Marshall, Eleanor D. and Moses, Evelyn B., LPN's, 1967, An Inventory of Licensed Practical Nurses. Division of Nursing, NIH, DHEW, Pub. No. 704-723, 1971.

9. 1974 Inventory of Licensed Practical/Vocational Nurses. American Nurses' Association, report in preparation.

10. 1974 Survey of Community Health Nursing. Division of Nursing, HRA, DHEW, report in preparation.

11. Nursing Personnel in Hospitals, 1972 Survey of Hospitals Registered with American Hospital Association. Division of Nursing, HRA, DHEW Pub. No. (HRA)75-16, December 1974.

12. Report on the Survey of Salaries of Nursing Faculty and Administrators in Nursing Educational Programs, December 1973. American Nurses' Association, 1975.

13. Roth, Aleda V. and Walden, Alice R., The Nation's Nurses, 1972 Inventory of Registered Nurses. American Nurses' Association, 1974.

14. Some Statistics on Baccalaureate and Higher Degree Programs in Nursing, 1974-75. National League for Nursing, 1976.

15. Survey of Foreign Nurse Graduate Applications for Registered Nurse Licensure, 1970-1973. Division of Nursing, HRA, DHEW, in preparation.

16. Survey of Registered Nurses Employed in Physicians' Offices, September 1973. Division of Nursing, HRA, DHEW Pub. No. (HRA)75-50, 1975.

PART III

SUMMARY OF FINDINGS

Section 951, of Title IX (the Nurse Training Act of 1975) of Public Law 94-63, requires the compilation and analysis of a comprehensive set of data on nursing personnel resources, both for the present and future, in the United States and within each State. This first annual report presents the data available at this time, discusses some of the gaps, and indicates the ways in which the Division of Nursing is working toward closing these gaps.

The data presented in this first annual report is centered primarily around the supply and distribution of nursing personnel. Supply and distribution cannot be interpreted fully without an interpretation of requirements that take into account the demand and need for the services nursing provides. The area of requirements is being refined at the present time through a series of modeling efforts which are described in part I of the report and, more fully, in appendix I. At the same time, additional efforts are underway to fill the gaps in the other data areas. It is expected that in the second annual report, due in 1978, information about supply, distribution, and requirements will be linked together to provide an overall analysis of nursing trends and their implications for the future.

The data included in this, the first annual report, reveal the following about the nursing personnel resources in the country:

- Preliminary projections of the registered nurse supply indicate that by 1990, the number of those available for employment would range between 1,467,000 and 1,541,000. About 62 percent of these would have as their highest educational preparation associate degrees or diplomas; 33 percent, baccalaureate; 5 percent, master's or doctoral degrees.

- In 1976, it was estimated that there were 961,000 registered nurses in the supply, 81 percent of whom had associate degrees or diplomas; 16 percent, baccalaureates, and 3 percent, master's or doctoral degrees.

- By 1990, preliminary projections show that the number of licensed practical or vocational nurses available for employment would range from 647,000 to 697,000. In 1976, there were an estimated 489,000 licensed practical or vocational nurses in the supply.

- State-by-State projections of nurse supply suggest that for future years, through 1980, most States would experience higher annual rates of increase among registered nurses than in the past recent years. For licensed practical nurses, the States will probably show lower rates of increase in the future than in the past.

- State-by-State projections of the registered nurse supply, according to educational attainment, show that while by 1980 in most States the proportion of nurses with associate degrees and diplomas would decline, these nurses will still represent a sizeable proportion of the nurse supply and their number will continue to increase. While baccalaureate-prepared nurses will increase in most States, they still will be a small proportion of the total supply, as will the master's- and doctorally-prepared nurses.

- An application of the educational criteria for registered nurse positions, developed by the Surgeon General's Consultant Group on Nursing in 1962, to the 1972 distribution of registered nurses showed that in 1972 all of the States fell far below the complement of baccalaureate- or master's- and doctorally-prepared nurses these requirements would indicate they should have.

- In the area of distribution, an analysis of the State by State nurse-to-population ratios indicate that there is wide variation in these ratios from State to State and that such variation would tend to continue into the future.

- A new tool being developed to look at within-State distribution suggests that the disparity among county nurse-to-population ratios in the State might be lessened when the ratio is based on the services the population actually receives rather than the size of the population. However, there is still wide variation among the counties within a State.

To fulfill the requirement in the Nurse Training Act of 1975 for the collection and analysis of data on nursing personnel on a continuing basis, data that were collected primarily from 1972 to 1974 were compiled from a variety of sources. The compilation of data not only points to the lack of current data of this nature but also to the missing information. In brief, the available data show:

- In 1972, about 29 percent of the registered nurses with current licenses to practice were not employed in nursing. This proportion varied from area to area with the largest proportions generally found in those areas where the ratio of employed nurses-to-population is the highest. According to a later study of the 1972 nurses, about 40 percent of the inactive registered nurses indicated some interest in returning to active employment, most often to a part-time position.

- About 31 percent of the employed registered nurses in 1972 were part-time workers. Here, too, there was variation from area to area with the largest proportion in those areas with the higher ratios of employed nurses-to-population. However, taking account of the numbers of nurses who are part time does not change the ranking of areas, although it does reduce the difference between the highest and lowest areas ranked by nurse-to-population ratios. Part-time nursing mainly includes younger nurses who are married, with children living at home. About 36 percent of the part-time nurses evidence some interest in becoming full-time workers at some time in the future.

- Licensed practical or vocational nurses show the same variability as registered nurses from area to area in terms of the proportion not actively employed in nursing and working part time.

- The majority of nursing personnel are working in inpatient settings, primarily hospitals. While this holds true throughout the country, variations in the proportions within such settings differ from area to area. Variations in the number of such personnel in relation to the clients served, as well as the mix of personnel, are also apparent from area to area.

- About 45 percent of the registered nurses in 1972 had position levels different from those of staff or general duty nurses, with about a third in positions such as head nurse, supervisor, instructor, or nurse administrator. However, in a review of activities undertaken by nurses, it would appear that about 20 percent of registered nurses with experience are in positions in which such activities as administration, supervision or teaching predominate.

- Compensation of nursing personnel, as reported in several studies of different types of settings in which nurses are employed, varied according to the type of setting, position level, and educational background of the nurse, and the area of the country in which the nurse worked.

- Currently, about 8,000 to 9,000 nurses enter the country annually. In recent years there has been a shift in terms of country of origin. The largest numbers no longer come from European countries and Canada; instead a greater number come from the Pacific and Asiatic countries. A special study, however, shows that foreign nurses taking the licensing examinations have high failure rates.

- Data available from a special study conducted in 1974 provided estimates that about 5 percent of the registered nurse population in 1972 were other than white; 3 percent were estimated to be black, and about 2 percent came from other minority backgrounds.

APPENDIX I

METHODOLOGICAL APPROACHES

OVERVIEW OF THE NATIONAL MODEL OF THE SUPPLY OF, DEMAND FOR, AND DISTRIBUTION OF NURSING PERSONNEL AND SERVICES
(Pugh-Roberts Associates, Inc.)

System Dynamics Modeling Approach

The model is being developed with a set of techniques referred to as System Dynamics. These techniques were developed at M.I.T. during the 1950's under the direction of Dr. Jay W. Forrester and have been applied to problems in industrial, urban development, public service, and national government settings. A System Dynamics model describes a set of causal relationships responsible for changes in variables of interest to policy-makers such as those variables characterizing the supply of, demand for, and distribution of nursing personnel and services. Causal relationships contained in the national nursing model describe, for example, the effects of a particular graduation rate on the number of nurses actively employed or the impact of wage levels on the number of nurses hired during a year to work in a certain employment setting. These relationships are responsible for changes that occur from one point in time to the next and determine how a system of variables, such as those characterizing nursing, will change over time.

The pattern of changes that will occur over time in this sort of system is difficult to anticipate because of the large number of relationships usually involved and the complex manner in which changes within the system interact to produce its overall behavior. For this reason, System Dynamics has within its repertoire a computer language called DYNAMO that allows the behavior of a system of causal relationships over time to be simulated. Once the relationships have been represented in DYNAMO's equation format, the computer takes on the work of calculating how the system will respond over time to changes induced in it. "What if?" questions can then be explored by making changes in the model's relationships to represent the implementation of various policies and programs or impacts of external forces. A "what if?" question about the impact on nursing requirements of a national health insurance program, for example, might be represented in the model by revising upward assumptions about the demand for care in various health care settings. The computer can then be used to determine how the nursing system would behave as a result of those changes. Many policy and program alternatives and other "what if?" questions can be explored in this manner.

The System Dynamics methodology has several characteristics that distinguish it from other methodologies that have been applied to nursing and to other facets of health care. These are worth mentioning:

- Uses of data--System Dynamics modeling uses good data, where available, to quantify causal relationships. When data are not available, estimates of important relationships are used rather than discarding those relationships from consideration.

- Evaluates policy--System Dynamics models are used principally for evaluating alternative policies and programs rather than precisely predicting future developments. Though these models typically simulate a system's performance over future time periods, the emphasis is on comparing results of simulations with alternative policies and programs instead of accurately forecasting system performance.

- Involves nontechnical participants--System Dynamics efforts typically involve nontechnical participants as sources of "data" on causal relationships. People who are familiar with the system being modeled are likely to be the best sources of information on that system. They are also more likely to implement policies and programs indicated as preferable by the model if they have had a role in the model's development and use.

- Emphasizes feedback loops--These are circular sets of causal relationships that are the focus of System Dynamics analyses. Such sets of relationships can work to accelerate changes introduced into systems (vicious circles) or to resist those changes. Identifying the feedback loops that principally affect changes in systems is essential for designing any policies and programs for improving those systems' performance.

- Takes a long-term view--Inventions in complex systems take a long time to carry out. A decision to make a major change in the mix of nursing personnel available, for example, will not have a significant impact until new programs have been set up, students are enrolled in and graduated from those programs, and sufficient numbers of graduates enter the nursing work force, a process that can take many years to occur. Dealing with problems and requirements as they arise is usually not satisfactory because of these long lead-times needed to intervene in complex systems, and it results in problems persisting or requirements going unmet much longer than they need to. The long-term view enabled by the System Dynamics approach permits problems and requirements to be anticipated and interventions to be initiated before crises occur.

Together these characteristics make System Dynamics well suited to complex problems in human service delivery where limited data exists, many interrelated factors must be considered, and the implications of any decision are far reaching and long term in nature.

System Dynamics modeling has already been applied to many different problems in health care. These applications include models for assessing dental care policies and manpower requirements, managing the interaction of medical schools and teaching hospitals, planning HMOs, evaluating the performance of alternative structures for ambulatory care systems, planning capital investment programs for hospitals, carrying out comprehensive health planning, designing programs for controlling narcotics addiction, and integrating health care with other human services. In each of these cases, System Dynamics models have contributed to a better understanding of the problems being analyzed and the impacts of alternative policies for dealing with those problems.

The Model Development Process

The national model has been developed with the active involvement of a task force that includes representatives of nursing service, nursing education, comprehensive health planning, the Division of Nursing in DHEW, and WICHE's nursing program staff. The involvement of this Task Force was an essential part of the model's development, because Task Force members provided direction that assured the model would be an accurate representation of the real-world nursing and health care systems and that it could address salient policy issues.

Task Force members were responsible for enumerating the set of factors that are contained in the model and acted as a sounding board through the development of several tentative formulations until an acceptable model structure was achieved. A wide variety of data sources were then used by the Pugh-Roberts consultants to verify the model's cause-and-effect relationships and to quantify those relationships.1/ Task Force members were the principal source of data required to quantify these causal relationships. They provided the necessary data by filling out and discussing questionnaires covering many of the model's relationships. Though these data were "soft" (i.e., based on informed estimates rather than on a survey), a careful search of the nursing literature and discussions with

---

1/ Data that characterized nursing employment and education at any point in time (e.g., numbers of nurses employed in each setting, enrollments in nursing programs) were generally available from sources such as the ANA's Inventory of Nursing Personnel and Facts About Nursing and the Division of Nursing's Sourcebook. However, data describing the effects that cause changes to occur in numbers of nurses employed and being educated between one point in time and the next were not readily available.

experts on nursing data revealed that these were the only data available on certain of the model's relationships. Following a thrust central to the System Dynamics approach, these data were used in the model rather than disregarding relationships that the Task Force had judged to be important, but for which no data existed. Available data were, of course, used whenever possible.

The Pugh-Roberts consultants used the causal structure developed by the Task Force and the data that had been assembled to represent the model in the DYNAMO simulation language. Initial simulations were made with the model and reviewed by the Task Force for their plausibility. Several rounds of revisions and further Task Force reviews then took place until an acceptable simulation was arrived at. In addition to Task Force review, several steps were taken to ascertain and improve upon the model's validity. Since all simulations with the model are initiated with 1972 data (the last year in which a complete set of the necessary data are available), the model's behavior between 1972 and 1976 was carefully scrutinized and compared to any actual numbers that were available for that time period. Adjustments were made to correct the discrepancies that appeared. Data were also obtained to initialize the model in 1962, and the period 1962-72 was simulated and compared to historical data as a further check on model validity. A final check, a process called sensitivity analysis, revealed which assumptions in the model had the greatest effect on model behavior and therefore where the greatest caution needed to be exercised in interpreting simulation results. Once the model had been validated and appeared to satisfactorily represent the real-world nursing system, the Task Force posed "what if?" questions about policies and future trends and reviewed the results of simulations that were performed to analyze those questions.

Overview of the National Nursing Model

This section presents an overview of the model's structure. The model's relationships fall into four highly interrelated and interdependent pieces or "sectors":

- Nursing education--representing the factors affecting the number of students in each major type of educational program and the graduation rates from these programs;

- Nursing employment--representing the factors affecting the number of nurses employed in each setting and various characteristics of employment in each setting, such as nurses' wages and nurses' roles;

- Demand--representing the health care provided in each sector of the health care delivery system, the nursing needs, and nursing jobs available in each employment setting; and

- Demographic--representing key demographic characteristics of the total population that impact on other sectors of the model, principally the demand sector.

An overview of some of the key relationships in the model is shown in figure I-1. As shown in that diagram, the number of nursing students graduating from educational programs, along with other factors, affects the total supply of licensed nurses at each level of educational preparation. Numbers of graduates depend on the number of places in programs at each level and the numbers of applicants to those programs. Nursing employment in each setting depends on both the number of nursing jobs available and the number of nurses willing to take those jobs (i.e., on both the demand for and supply of nursing personnel). The health care provided in each sector of the health care system, nurses' wages, nurses' responsibilities, and other factors affect employers' desired staffing patterns and the number of nursing jobs available in each setting. Important influences on nurses' willingness to take available jobs include nurses' wages, nurses' roles and responsibilities, the match between qualifications of available nursing personnel and requirements of available jobs, the location of jobs relative to where available nurses live, factors affecting the relative attractiveness of employment in different settings, and demographic characteristics such as nurses' age distribution, the fraction married, and child-bearing patterns. The volume of health care delivered in each setting is affected by the size and age composition of the total population, care requirements for people in each age group, the financial and geographical accessibility of care, and the attitudes of people toward seeking care.

The model explicitly considers seven major employment settings, some of which have several subsettings. These settings are:

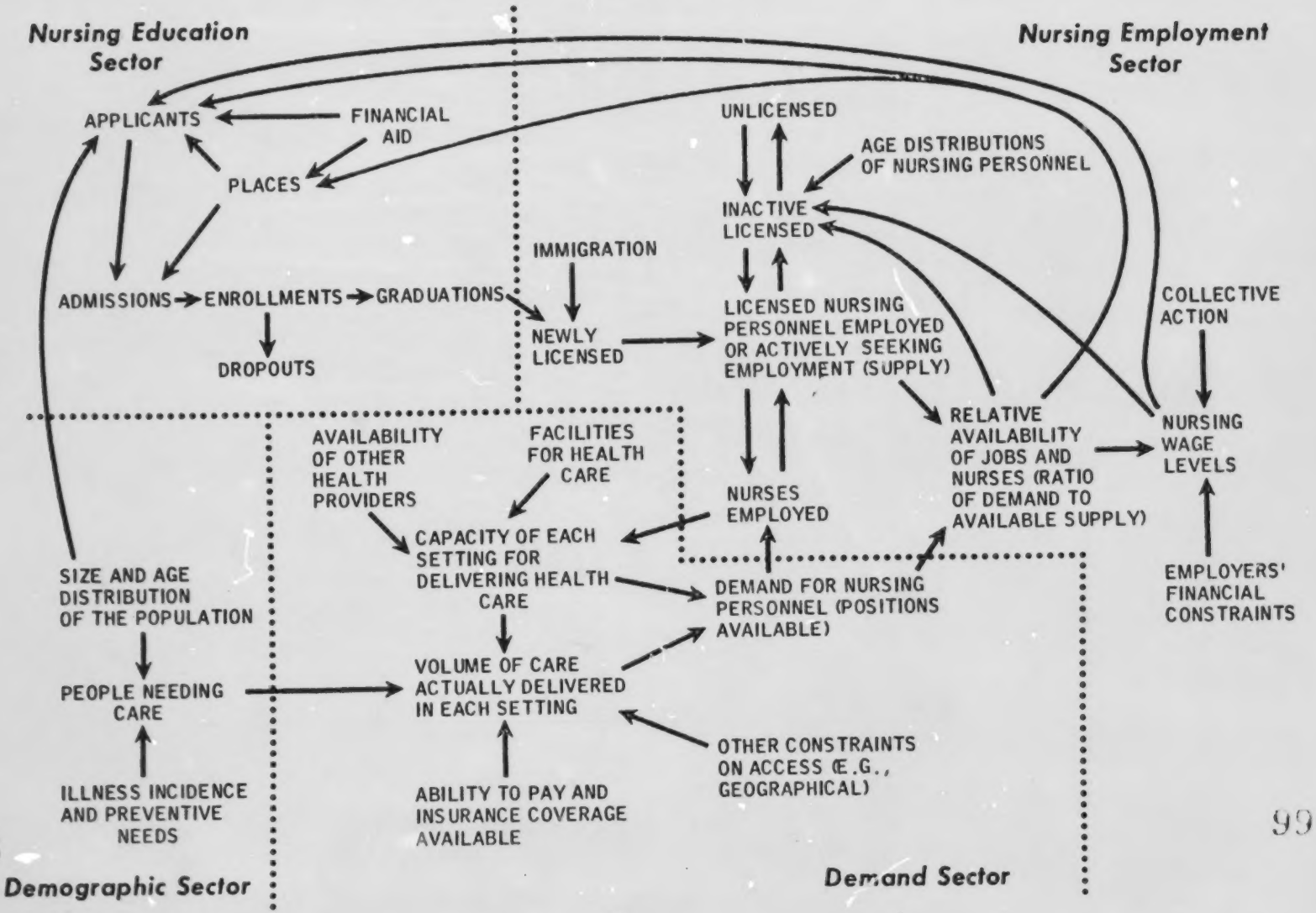
- Hospitals disaggregated into:

  - short-term, and

  - long-term (chronic disease, mental, TB) hospitals.

  Hospital employment includes all nursing personnel concerned with inpatient care and administrative functions, but excludes personnel providing outpatient care (OPD and emergency room), who are considered part of the ambulatory setting or teaching staff in hospital-based schools of nursing.

Figure I-1.--Overview of the national nursing model



- Ambulatory care disaggregated into three subsettings:
  - physicians' offices and group practices
  - hospital outpatient departments and emergency rooms
  - community health centers and mental health centers.
- Long-term care (primarily nursing homes).
- Home health care (including Visiting Nurse Associations and nurses in public health agencies devoted to home care).
- Schools of nursing (faculty in programs educating nursing personnel).
- Public health disaggregated into three subsettings:
  - public health and voluntary agencies (excluding nurses providing home care)
  - school health
  - occupational health
- Private duty and other (includes nurses working in hospitals on a temporary basis through central registries in addition to the more traditional private duty employment).

Employment reported for any one of these seven settings is the total of employment in each of the subsettings listed.

The model also differentiates among nurses at various levels of preparation employed in each setting and disaggregates educational programs preparing personnel at those levels. Five separate levels of educational preparation are included in the model. They are:

LPN
Associate Degree
Diploma
Baccalaureate
Advanced

The model also differentiates among the need for nursing personnel (the number that it would be desirable to employ to serve the population's health care needs), the demand for nursing personnel (positions made available by employers given the population's actual utilization of and perceived need for health care and various constraints on those employers), and the number of nursing personnel actually employed (given positions available and nursing personnel available and willing to take those positions).

The model shown in figure I-1 goes beyond previous modeling efforts in nursing by including factors affecting the supply of and demand for nursing personnel in the same framework. Earlier efforts have projected supply or requirements separately. In this model, the number of nursing personnel employers are willing to hire is a function of the numbers available, the financial situation of those employers (as affected by cost controls, adequacy of Medicare reimbursement, etc.), and patient care requirements each employer must provide for. Similarly, the number of nursing personnel available at any point in time is determined not only by the number that have been graduated in the past, but also by the number of nurses willing to work as a function of prevailing wages, the breadth of responsibilities entailed in available jobs, and the number of jobs available relative to the number seeking jobs (in addition to the age distribution of nurses, their marital status, and career orientations).

A change in either the number of jobs or the number of personnel available will, in time, cause the other to change. In the model, a constant or declining number of jobs will eventually discourage people from entering nursing programs and dissuade inactive nurses from seeking employment, while an expanding number of jobs encourages growth in applications to nursing programs and higher activity rates. High vacancy rates will cause employers to eventually eliminate some unfilled jobs or fill them with lesser skilled personnel, while an excess of nursing personnel will enable employers to deal with pressures to upgrade their nursing staffs. By representing this interaction between supply and demand, the model keeps either one from getting too far out of line and assures reasonable conformity to what would happen in the real-world nursing system.

The model represents nursing and health care as they now exist and where they are likely to be going over the next few years. Certain developments (e.g., independent nursing practice) are not built into the model's baseline assumptions (the set of things that are likely to happen in the future) because of the uncertainties surrounding those developments. This does not at all preclude the model from dealing with these issues. Instead, the model is applied to developments appearing on the horizon by using it to do a series of simulations in answer to "what if?" questions about those developments. Independent practice, for example, might be explored with a set of simulations that

reflect different assumptions about the growth rate for this mode of practice and reveal its impact on nursing requirements and on the supply of health care available. Many other developments such as trends toward the involvement of nurses in comprehensive well-care and preventive-care and in other new roles can be considered in a similar manner.

THE IMPACT OF HEALTH CARE SYSTEM CHANGES ON THE NATION'S REQUIREMENTS FOR REGISTERED NURSES IN 1985

(Vector Research, Inc.)

General Methodology

The reason for developing the model described in this paper is to assess the impact of three anticipated changes in the health care system on the requirements for nurses. The three changes under investigation are:

(1) the introduction of national health insurance (NHI);

(2) the increased enrollment in HMOs; and

(3) the reformulation of nursing roles.

Estimates of requirements are made for two types of licensed nursing personnel: registered nurses (RNs), and licensed practical nurses (LPNs), both nationally and by State. The base year selected for these estimates is 1972, with current estimates being made to 1975 and projections to 1985. Requirements are further categorized by major employment settings: non-Federal short-term hospital inpatient units, hospital outpatient units, physicians' offices, six nursing homes, HMO clinics, and the community health settings.1/

Approach to Requirements

The VRI Model predicts requirements for nurses under various health care system scenarios, including various health insurance plans, different levels of HMO enrollment, and different levels of nursing role reformulation. One such scenario is the absence of health care system changes; i.e., no NHI, no change in the number of operational HMOs, and no additional role reformulation. Another scenario--the "most probable" scenario--is the set of health care changes deemed most likely to occur.

1/ These settings are the ones most greatly affected by the health care system changes under consideration, and contain nearly all of the employed nurses. Other settings, not explicitly shown in the figure, contain the remainder of employed nurses and are treated in a less comprehensive fashion. The latter settings include nurses in Federal and long-term hospitals, nurse educators, private duty nurses, and miscellaneous nurse employment settings.

The schematic model structure shown in figure I-2 describes the major model components and outlines the conceptual approach employed to assess the future requirements for nurses. Briefly, it is hypothesized that the future requirements for nurses are dependent on three factors: the size and composition of the future population, per capita demands for health care services, and the organizational systems used to provide the services demanded. These three factors correspond to the three major sections of the model--the population section, the demand-for-services section, and the nurse manpower requirements section. These model sections are discussed in further detail in the following paragraphs.

The Population Section

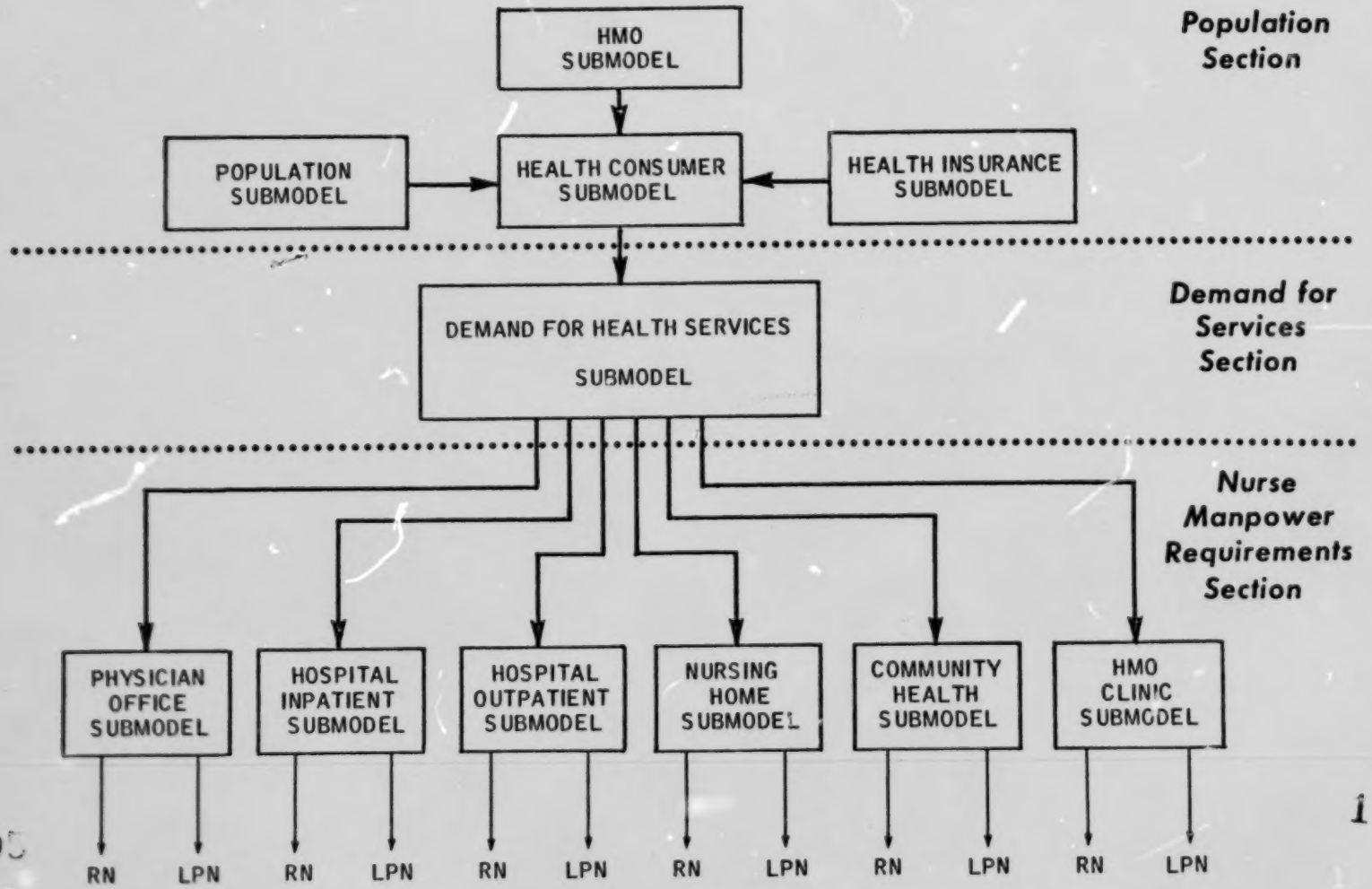
The population section consists of four submodels. The first of these, the population submodel, provides a description of the size and composition of the future U.S. population. The second, the health insurance submodel, is used to quantitatively describe current health insurance coverage, as well as that anticipated under alternative national health insurance proposals. The third, the HMO submodel, estimates future HMO enrollment. The output of these three submodels is then integrated in the health consumer submodel to characterize the future population of health consumers.

The population submodel uses Bureau of Census predictions of the future population by age and sex to further apportion the population by income and family status groupings. The major assumptions underlying this submodel are: (1) that an individual's family income and family status are dependent on his age and sex, and (2) that this dependence is time invariant. These assumptions, although not ideal, are similar to those used by the Bureau of Census in estimating future family income in relation to age of the head of a household. Further, overall model output will be relatively insensitive to the level of errors inherent in these assumptions.

The HMO enrollment submodel estimates the future size of the HMO population by adding the number of enrollees in newly formed HMOs to the number of enrollees in existing HMOs. The submodel is based on empirical evidence suggesting that enrollment in existing HMOs increases at a rate which is dependent upon the length of time the HMO has been in operation.

The health insurance submodel provides a description of the health insurance coverage of the population. Both current insurance and proposed national health insurance plans are characterized by the fraction of each population cohort (age, sex, income, and family status group) covered, and by the effective coinsurance rate for the different types of health services.

Figure I-2.--VRI nurse manpower requirements model



The final submodel in the population section is the health consumer submodel. This submodel performs three tasks. First, it distributes the HMO enrollees across each age, sex, family income, family status population cohort. Then, it determines the size of the non-HMO population (by cohort) by subtracting the estimated HMO population from the estimated total population. Finally, it uses the input from the NHI submodel to assign insurance coverage to the non-HMO population. As a consequence of this operation, the population section provides a complete characterization of the health consumer population for each year in terms of age, sex, family income, family status, HMO enrollment, and insurance coverage for various types of health care services.

The Demand-for-Services Section

The output of the population section is used by the demand-for-services section to estimate the aggregate demand for health services in each of six major care settings: physician office, hospital inpatient, hospital outpatient, nursing home, community health, and HMO clinic settings.

The future utilization of health services is predicted by combining estimates of the per capita demands for each type of health service with the population data generated by the population section. Estimates of per capita demands are based on historical data available from large-scale surveys, social experiments and research studies. These estimates are made as a function of health insurance characteristics, population cohort characteristics, and health service setting. The results from the product of these per capita demands and the estimated future population provide the projected amounts of services demanded in each setting.

Two major assumptions which underlie use of the demand-for-services submodel are:

- Per capita demands for health care are functions of cohort characteristics and can be determined from historical experience.
- There will not be a significant substitution of one historical care for another other than that which historical trends would predict.

These assumptions will be relaxed to the extent possible in the final stages of the project.

Nurse Manpower Requirements Section

The nurse requirements section consists of six separate submodels, one for each of the six care settings (see figure I-2). These submodels determine the number of full-time equivalent (FTE) RNs and LPNs required to provide the quantity of services demanded in each setting. In two of

the settings, physician office and hospital inpatient, this determination takes into account the extent to which role reformulation may occur. The structure of each of the six submodels and the technique for representing role reformulation are discussed in the following paragraphs.

The first submodel, the physician office submodel, predicts the number of RNs and LPNs employed in physician offices as a function of the number of office visits demanded. This submodel is based upon a production function which relates visits per physician to employees per physician. The major assumption behind the methodology is that the future requirement for nurses will depend on future imbalances between the supply of physicians in office practice and the demand for services in this setting. If, for example, the demand for office visits increases faster than the supply of physicians in this setting, the requirement for nurses will also increase.

The hospital inpatient submodel has as input the number of bed days demanded in year "t" and predicts the number of FTE RNs and LPNs required to provide these services in short-term general hospitals. The prediction of inpatient nurse requirements is divided into three nursing categories. These are:

- the number of hospital-based nurses not employed in the Department of Nursing Service;
- the number employed in intensive care units; and
- the number employed in the Department of Nursing Service but not in ICUs.

Nurses employed in hospitals but not working in the Department of Nursing Service include hospital administrators, nurse anesthetists, research nurses, and nurses employed in departments of central service. Nurses in the Department of Nursing Service include employed nurses plus budgeted vacancies.2/ These three categories of nurses in hospitals are estimated from recent trends in their values. This categorization was used because it explains previous data reasonably well. However, a more refined submodel, recently completed, will also be tested in this setting. In addition to total patient days, this model employs hospital occupancy, admission rate, and length of stay to predict requirements for nurses.

The hospital outpatient submodel estimates the number of nurses required in hospital outpatient clinics and emergency departments as a function of the total number of visits to such settings. The estimates are based on the historical data which have shown nurse employment in hospital outpatient departments to be directly proportional to the number of outpatient visits.

2/ Vacancies have been declining and are assumed to continue to do so.

The requirements for nurses in nursing homes are determined by the same procedure as for the outpatient setting, except that the methodology differentiates between the two types of nursing homes defined by NCHS as nursing care homes and personal care homes with nursing. 3/ This differentiation is necessary to compensate for the different intensity of nursing services in each type of home.

The community health submodel estimates the number of nurses required for home care, school nursing, occupational health, and other community health activities. For all of the above activities except home care, the submodel bases its estimates upon current trends and does not require inputs from the demand-for-services section. The projected requirements for home care nurses is determined from the projected number of home care visits estimated in the demand-for-services section by assuming the number of visits provided per nurse remains constant.

Finally, the HMO clinic submodel determines the number of nurses required in HMO ambulatory clinics each year as a function of the number of HMO clinic visits estimated by the demand for services section. The number of nurses required is assumed to be directly proportional to the number of visits demanded.

As previously mentioned, the effects of role reformulation are treated in the nurse requirements section. However, only those role reformulations which will substantially affect the requirements for nurses are explicitly treated. These include: (1) the employment of nurse practitioners (an example of role extension in the physician office environment), (2) the increased utilization of clinical nurse specialists (an example of role expansion in the hospital inpatient environment), and (3) the adoption of the primary nursing concept (an example of changes in task mix in the hospital inpatient setting).

The methodology for treating role extension in the physician office environment hinges on several key assumptions. First, it is assumed that physicians will not increase their working hours in order to satisfy an increased number of office visits. Also, decreasing marginal gains in productivity prevent the physician from expanding his staff indefinitely to satisfy additional demands for services. Consequently, the model assumes that a portion of the services demand in physician office visits will be supplied by nurses in extended roles.

In the hospital inpatient environment, the influence of clinical nurse specialists employment in new roles is assessed by determining the number of additional nurses required to replace those who enter these new roles. This increased manpower requirement is derived by

---

3/ Other types of nursing homes are included in the latter category.

estimating the fraction of newly trained clinical nurse specialists that provide services outside of current nursing roles. The effect of primary nursing in the hospital setting is treated by (1) estimating the increase in nurse-to-aide ratios typical of primary nursing units, and (2) predicting the growth of the primary nursing concept.

Approach to Supply

The VRI nurse requirements model does not explicitly treat nurse supply.

Data Needs

The VRI modeling effort does not include the collection of primary data and is therefore constrained to using existing data. At the national level, most of the necessary data have been compiled and have been used to estimate parameters of the requirements model. However, refinements to the data base are continuing. At the State level, part of the requisite data have been acquired, although no State-level estimates have been made.

In this subsection, a very brief synopsis is given of the major data sources used so far. It is organized in a fashion parallel to that of the overall model as indicated in figure 1.

The Population Section

Nearly all data characterizing the general population required for this section are derived from Bureau of Census sources. However, the HMO submodel uses data collected by InterStudy to predict the size of the HMO population and to estimate the demographic composition of that population. The data employed in the characterization of current health insurance coverage and that proposed under National Health Insurance include insurer group data such as that available from Health Insurance Association of America, Social Security Administration data, information and data compiled by the National Center for Health Statistics, and specific provisions contained in congressional proposals for national health insurance.

The Demand-for-Services Section

As noted above, this model section is essentially a large matrix of data describing the utilization of services by each population cohort. Of primary interest in the construction of this matrix are variations in the per capita demand as a function of insurance coverage, including enrollment in health maintenance organizations. Data used to estimate the per capita demands in this matrix include:

- Health Interview Survey data from NCHS and American Hospital Association data concerning demands for hospital inpatient, hospital outpatient, and physician office services;

- Master Facility Index survey data from NCHS on the utilization of nursing home services;

- Data from Kaiser Portland on the demand for home care visits;

- Data from a special report on prepaid group plans by John T. Gorby and Associates concerning HMO clinic visits and hospital patient days; and

- Data describing the differences between per capita demand for insured and uninsured individuals (e.g., the Palo Alto experiment, data from National Opinion Research Center, and results of economic analyses such as those by R.R. Nathan Associates and the Rand Corporation).

The Nurse Requirements Section

The types of data required in this section include numbers of nurses employed in various settings in previous years, and information on the productivity of nurses in these settings. In the physician office setting these sources include provider data furnished by the AMA, the continuing survey by Medical Economics, and a study by Reinhardt in 1970 on the economics of physician office practice.

In the hospital settings, key data sources are the biennial survey of Nursing Personnel in Hospitals, and certain AHA data, including a study by Levine and Phillip in 1973. Also, vacancy data in hospitals were obtained from published Government reports and a study by Yett in 1969.

Further data used in this section were obtained from various editions of Facts About Nursing, an unpublished 1972 Survey of Public Health Nursing, and other sources.

The only area in which a significant amount of subjective estimation is required is in the assessment of role reformulation effects. Because of the relatively small degree to which role reformulation, as it has been defined, has taken place, and because of the dearth of data on these changes, the growth rates and other parameters of role reformulation of necessity are somewhat speculative. Best estimates are being made through a combination of existing data and consultation with an expert nursing advisory panel.

Model Output

Once the model is completed, estimates will be made of requirements for RNs and LPNs, both nationally and by State, for the 1975-85 time period. These requirements will be categorized by major employment settings: non-Federal short-term hospital inpatient units, hospital outpatient units, physician offices, nursing homes, HMO clinics, community health, and other settings. Projections will be made under various health care system scenarios, including alternative NHI plans, various levels of HMO enrollment growth, and different degrees of nursing role reformulation. One scenario will be identified as the most probable to occur. Comparing the results of these model runs will provide an estimate of the relative effects of individual health care system changes and the interactions among simultaneous health care system changes on nurse manpower requirements.

Although the current effort will provide estimates of requirements from a particular base period, it is felt that the model should be updated annually to reflect the major new data continuously becoming available. Consequently, the model will be exercised in a series of parametric analyses to determine its sensitivity to key model assumptions and parameters. This analysis can then be used to determine in what areas the model output needs to be updated as changes in the health care system are observed over time.

The quality of the final estimates will be assessed by determining variance which, in turn, will be obtained from an analysis of the variance of the raw data used as input overall model requirements. Thus, for each scenario, a best estimate of nurse requirements, as well as the expected variance about this estimate, will be established.

ANALYSIS AND PLANNING FOR IMPROVED DISTRIBUTION OF NURSING PERSONNEL AND SERVICES: STATE MODEL
(Western Interstate Commission for Higher Education)

The State Model consists of an integrated set of data affecting the supply of and requirements for nursing. This abstract discusses only the requirements portion of the model. The term "model" is defined as "almost always a mathematical, and necessarily an approximate, representation of reality. It must be formulated to capture the crux of the decisionmaking problem. At the same time, it must be sufficiently free of burdensome minor detail to lend itself to finding an improved solution that is capable of implementation."1/

The requirements analysis process in this model provides an analytical framework supported by data where available, through which projections are derived in a logical, systematic, sequential approach for the need for nursing personnel 1 to 5 years in the future. As outlined below, there are six steps in the analytical process for making requirements projections:

- Differentiating the client population.
- Assessing the health needs of the population.
- Formulating a health strategy.
- Choosing the level and mix of nursing services.
- Determining the level and mix of nurse staffing.
- Staffing schools of nursing.

These are detailed in the following discussion:

Differentiating the Client Population

The first decision point in the requirements planning process has to do with the population that is being served. Data on key demographic variables such as age, race/ethnicity, sex, income, educational attainment, and occupation are displayed for the particular geographic locale--be that State, HSA, or groupings of counties. Supporting discussion material make numerous references to research literature which illustrates how these demographic characteristics are associated with particular health needs. The decision point relating to the population should be differentiated so that their health needs might be better assessed. A major purpose of the

1/ Harvey M. Wagner, Principles of Operations Research, 1969.

discussion material and data is to identify what health needs are unmet and which specific population subgroups are especially affected.

Assessing the Health Needs of the Population

Closely allied to differentiating the population is the next decision point in the requirements process: how to assess the health status of the population in terms of quantitative health-status indicators. Definitions of health indicators and a summary of the different varieties of quantitative indices that have been suggested as measurements of health, along with their limitations, are presented. Data on a variety of possible health-status indicators, including a variety of morbidity/mortality statistics, are available. The decision point relates to the particular data to be examined and how these data might be interpreted. The use of health-status indicators as a means for tracking and evaluating progress is presented.

Formulating a Health Strategy

Given this foundation, the next decision point relates to the identification of a specific set of health goals, or if general health goals already exist, the adoption of these into a form more meaningful for planning purposes. These goals will form the basis upon which subsequent decisions about health services and nursing utilization will be made. Although very limited quantitative data is relevant to this point, examples of actual goals established by areawide planning agencies and State-level organizations, as well as national priorities established by Federal legislation, are cited to provide appropriate background material. Additional citations from the health-planning literature indicate how, by whom, and by what means these goals might be formulated. Besides providing for more focused planning and facilitating program accountability, goal-oriented planning also affords feasible opportunity for consumer input into the planning process.

Choosing the Level and Mix of Nursing Services

Once health goals have been determined, the questions of programmatic thrusts are considered. The most immediate question is how health programs might be conceptualized. This problem is discussed in detail and several alternative conceptualizations are presented, ranging from more traditional categorizations--inpatient, ambulatory, emergency, outreach--to the terminology advanced in recently proposed HSA regulations--community health, prevention and detection, diagnosis and treatment, habilitation and rehabilitation, maintenance, and support. Next, the emphasis to be given to particular health programs is addressed. This serves to highlight three important issues. First, it provides an opportunity for seeking to change the way in which the health care delivery system is structured if such change seems desirable. Secondly, it also raises the issue of cost

containment. By shifting the existing relative emphasis of health programs, is it possible to achieve less costly health care with no loss in quality? Finally, the considerations of health programs also underscore the importance of emphasizing wellness-oriented preventive care in health planning.

Building upon the decisions regarding health programs, there is the more detailed issue of health services. More specifically, the estimated levels of various health services, ranging from seven types of hospital beds to ambulatory visits such as outpatient clinic, referred, and community health visits, are considered in relation to what is most desirable, given limited resources and what has been obtained in the past. The context in which this is determined is based on what is feasible within the 1- to 5-year time frame in working toward the previously established health program goals. Recent data on health services are presented to provide a baseline from which these estimated levels can be extrapolated. Drawing upon a rich literature dealing with health expenditures and utilization of health services, empirical results from other studies are cited to better enable planning for health services to take place within the context of consumer preferences and behavior patterns.

Appropriate Staffing Patterns

The final set of decisions that the user must face is the interrelationship of nursing personnel utilization patterns within health services. The staffing area, more than any of the previous areas, draws upon the data base quite extensively. Considerable data on employment settings, positions, and educational attainments of nurses are displayed. In the nurse staffing area, much attention is given to the crucial issues that are facing the nursing community with regard to the educational preparation of registered nurses and expanded roles for nurses. The importance of nurse practitioners is also underscored. In addition, the necessity of considering nurse staffing in the context of the roles that other health professionals play in the delivery of health care is examined.

The foregoing sections have generally described the decisionmaking process outlined in the requirements portion of the State Model. In addition to the decisionmaking process, mathematical equations which derive from the decisionmaking process have been developed for use in projecting nursing requirements 1 to 5 years into the future. In their present form, these equations are generally formulated in terms of the population, health services, and nurse staffing considerations.

The interrelatedness of decisions to one another is a notable aspect of the way in which the decisionmaking process is formulated. Decisions encountered later in the decisionmaking sequence are built upon earlier decisions, later decisions may cause earlier ones to be reconsidered, while still other decisions have to be addressed simultaneously.

A MICRO-MODEL FOR NURSING MANPOWER NEEDS
(CSF, Ltd.)

Introduction

This paper describes models which have been developed under a contract from the Division of Nursing, Bureau of Health Manpower, Department of Health, Education, and Welfare. The project is aimed at development and testing of models which incorporate health services utilization factors and factors affecting demand and supply for nursing manpower into a framework for determining nursing manpower needs. The models contain specific institutional characteristics and are capable of predicting demand and supply for nursing manpower at county and State levels.

Demand and supply models have been developed for four categories of health care settings: (1) acute care, (2) long-term care, (3) ambulatory care, and (4) community and public health. This paper describes models for predicting demand for nursing manpower in acute and long-term care facilities. Definitions of acute and long-term care facilities, which have been used throughout the project, are consistent with those of the American Hospital Association.

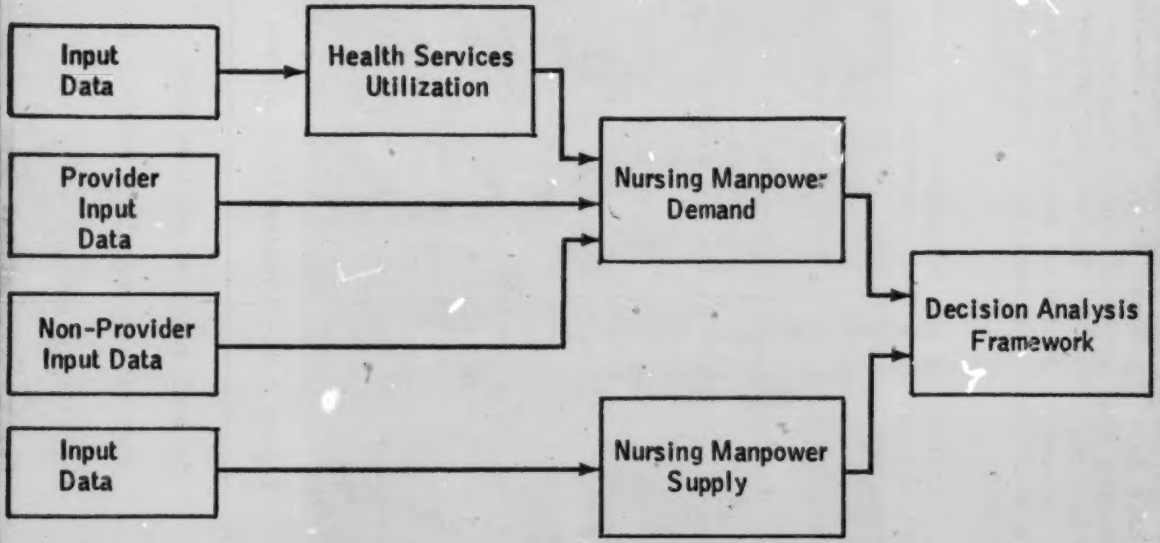
Model Development Strategy

Both acute and long-term care models have been divided into three submodels as shown in figure I-3. The health services utilization submodel is designed to predict the demand for health services, in patient days. The output of this submodel serves as an input to the nursing manpower demand submodel which converts demand for health services to demand for nursing manpower in man-hours, full-time equivalents, or a similar measure.

In constructing the models, it was assumed that only currently available data would be used in model construction and during implementation. A prior contract awarded by the Division of Nursing resulted in the construction of a supply model which was modified for use in this project (1).1/ For this reason, only the health services utilization and nursing manpower demand submodels will be discussed in this paper. The decision analysis framework relates to reducing demand by supply resulting in a need estimate (or over supply).

1/ Numbers in parentheses refer to references cited in the list at the end of this paper.

Figure I-3.--Acute and long-term care submodels



Health Services Utilization Submodels

Categories of output for the acute care health services utilization submodels are shown in figure I-4. There is only one category of care in the long-term care case: patient days. The modeling process was concerned with determining what types of input data might be used as causal predictors of the desired outputs. The project attempted to come as close as possible to an exhaustive search of available data. Two major types of input data were identified and analyzed: census or demographic data, and institutional data.

Data used in constructing the submodels were taken from the following sources: (1) institutional data from approximately 350 acute care and 2,000 long-term care institutions, (2) over 20 computer tapes obtained from governmental agencies, (3) tract level computer tapes from the U.S. Bureau of the Census, and (4) over 70 nursing-related data sources.

Acute care institutions were categorized by four major characteristics: bed size; control, e.g., proprietary, governmental; level of technology; and teaching/nonteaching. Within each characteristic, there are several levels of breakdown. For example, size is divided into: 0-49 beds, 50-149 beds, 150-299 beds, and 300+ beds. Technology levels were defined using an index developed by Northwestern University and the American Hospital Association (2). Long-term care institutions were categorized by bed size and control.

Step-wise multiple regression was used to develop the utilization submodels. There were several reasons for the choice of this methodology: the methodology lends itself to efficient analysis of large quantities of data; highly efficient computer programs were available for interactive time shared use; and members of the project team and other researchers had successfully used this methodology in similar development activities.

Figure I-4.--Categories of output

Medical/surgical patient days
Obstetrics/gynecology patient days
Pediatrics patient days
Psychiatric patient days
Operating room procedures

For each category of acute care institution, five regression equations were developed, one for each category of output shown in figure I-4. In many cases, insufficient data required pooling of institutional categories such as bed size. The analysis resulted in 20 different acute care models and 8 long-term care models. Figure I-5 is a listing of the independent variables which are contained in these models. The regression analysis resulted in these variables being selected as predictors out of a total of 31 possible census variables and 42 possible institutional variables. In most cases, a specific model contains only four or five of the variables.

The analysis described up to this point resulted in 28 causal models which will estimate health services utilization as a function of the various independent variables shown in figure I-5. However, the project was also concerned with making health services utilization estimates each year for a 10-year period. Therefore, models were developed to make annual projections for the variables shown in figure I-5. Methods used varied from simple linear projections to exponential smoothing. Data availability was the major limitation in choosing a projection method.

Figure I-5.--Independent variables in acute and long-term care utilization submodels

Census variables	Institutional variables
Total population	Number general hospitals in area
White population	Total mortality
0-5 population	Number MD office
6-15 population	Number MD hospital
16-44 population	Number nursing homes
45-64 population	Number office visits
65+ population	Percent MD Pediatrics
Female population	Percent MD Surgical
Female population 14+	Percent MD OB/GYN
Female unemployed	Percent MD other
Total aggregate income	Number beds in institution
Aggregate income: earnings	
Aggregate income: social security	
Aggregate income: public assistance	
Family income: $8,000-14,900	
Family income: $15,000-25,000	
Family income: over $25,000	
School years 13-15	

Nursing Manpower Demand Submodels

The nursing manpower demand submodels convert the demand for health services, usually in patient days, for acute and long-term care institutions to demand for nursing manpower, in man-hours of full-time equivalents. Demand is estimated for three types of nursing personnel: registered nurses (RNs), licensed practical nurses (LPNs), and nursing assistants (aides, orderlies, etc.).

A recent comprehensive analysis of nursing man-hours per patient day provided in acute care settings has been made by Levine and Phillip (3). This study analyzes the variations in nursing manpower provided among geographical areas of the country, hospitals of varying bed sizes and other factors. While the study results do provide some insight into the categories of acute care institutions used in this project, there are substantial differences in the categories used. The raw data from over 2,000 acute care institutions used by Levine and Phillip have been obtained and are currently being used to estimate nursing manpower demand for the categories of acute care institutions defined in this project. Where geographical differences are significant, individual estimates will be made for different geographical areas of the country.

Data such as that used in the Levine and Phillip study are not available for long-term care institutions. A research project currently under way at Johns Hopkins University has estimated nursing man-hours provided in a form consistent with the three categories of nursing personnel used in this project. While the number of long-term care institutions surveyed in the Hopkins' study is small, it appears to be the best available data and, therefore, will be used as the basis for estimating nursing manpower demand in the long-term care environment.

Computerized System

Computer programs have been developed to allow use of all submodels generated by the project in either an interactive or batch mode. The user may select submodels corresponding to institutions for which supply and demand estimates are to be made. The system also requires data related to each institution corresponding to figure I-5. Given these inputs, the system outputs include: (1) utilization in patient days categorized to correspond to figure I-4, (2) demand in man-hours categorized according to figure I-4, (3) supply in man-hours or full-time equivalents, and (4) need (demand less supply) in man-hours or full-time equivalents. In the case of demand, supply and need estimates are made for three levels of nursing manpower: RN, LPN, and assistants. All estimates are made for each year during a 10-year period.

Summary and Conclusions

The micro-model for nursing manpower needs is currently being tested and evaluated in one State, one metropolitan area and three Health Services Agencies (HSAs). It is clear that utilizing available data places a severe restriction on the construction of an institution-specific model. For this reason, the current micro-model should be considered more reliable when aggregated to the county, multiple county, or State level. The modeling effort reported here has laid the foundation for the development of a more reliable institution-specific model.

Use of the micro-model will be focused on the county, HSA, or State level. Use at these levels requires that the health services utilization and demand submodels be applied to each institution within the geographical area. These estimates may then be aggregated to the appropriate level. In this way, the micro-model should play a significant role as the first major effort to construct a model for use in State and substate nursing manpower planning throughout the United States.

References

1. Jones, D.C., et al., "Procedure for Projecting Trends in Registered Nurse Supply," Research Triangle Institute, March 1975, (FR-240-1024-2), Division of Nursing, Bureau of Health Resources Development, HRA, DHEW.

2. Edwards, Mary, et al., "Further Investigation of Two Aspects of the General Services Index," Technical Paper 1, Health Services Research Center, Northwestern University, Chicago, Illinois, May 1975.

3. Levine, H.D. and P.J. Phillip, "Factors Affecting Staffing Levels and Patterns of Nursing Personnel," DHEW Publication No. (HRA) 75-6, February 1975.

THE ASSESSMENT OF NURSING SERVICE AND
RESOURCE DISTRIBUTION MODEL
(Information and Communication Applications, Inc.)

ANSERD Design Requirements

The ANSERD design requirements evolved from a set of relationships describing the interaction of patients, nurses, and the overall health care enterprise:

- Nurses, except for a small proportion classified as nurse practitioners, need an intermediary framework such as a facility, organization or medical practice to apply their nursing care skills and knowledge.

- Frameworks can be classified into two major categories:

  - Health care service delivery frameworks (DFs)--frameworks that employ nurses and use their health care skills and knowledge for the delivery or direct support of the delivery of nursing services to the general population or a subset of the population.

  - Nondelivery frameworks (NDFs)--frameworks that employ nurses but use their health care skills and knowledge for other than the delivery or direct support of the delivery of nursing services to the general population or a subset of the population.

- Members of the general population are the direct consumers of health care services provided by the DFs, but are only recipients of nursing services as they are dispensed by the DFs. In an economic sense, the DFs are the direct consumers of nursing services.

- Delivery frameworks have different service areas, defined by geography or population subsets, or both, and are not always constrained by traditional geopolitical boundaries.

- Delivery frameworks, by virtue of the different types of health care services they render, have different levels of nurse utilization.

- All frameworks have similar resource areas from which to draw nursing personnel. The extent of these areas is defined by a distance function determined by the nurses' propensity to travel to a particular framework, given a willingness to be employed by the framework.

The evaluation of these relationships in the context of a distribution measure at the county or county equivalent level of geopolitical resolution led to the major ANSERD model design requirements, summarized below.

- Distribution of registered nurses should be measured from two perspectives--service and resource. The service measure should reflect the amount of registered nurses' services available to residents of a county from the delivery frameworks. The resource measure should reflect the number of registered nurses available for potential employment by all frameworks located in the county.

- Service distribution can be measured by a nurse-to-county population ratio but should be calculated to:

  - Include only nurses employed in DFs;

  - Maintain DF identity, since each may serve a different population subset;

  - Exclude nursing services provided by the DFs to residents of other counties;

  - Include nursing services obtained by the county population from similar DFs located in other counties.

  In summary, service distribution should be measured through frameworks and not directly against indigenous county populations.

- Resource distribution should be measured against frameworks, not population; therefore, the personnel-to-population ratio is not appropriate. A ratio of the number of RNs available to the number of RNs employed can be used to measure resource distribution. The measure should include but maintain separate identity of nurses from the county itself and from other counties within commuting distance.

ANSERD Model

The operational ANSERD model consists of a Service Distribution Assessment Subsystem, a Resource Distribution Assessment Subsystem, and a specially created data base shared by both subsystems. The subsystems are independent and generate separate reports.

ANSERD Data Base

The ANSERD data base contains data on nurses, health care facilities, and populations. It also contains the Inter-County Distance Universe (ICDU), a specially created file specifying inter-county distances required by the estimation procedures of the operational model.

The primary source of the health care and population data was the Nursing Environment Information System (NEIS).1/ The specific NEIS files used were:

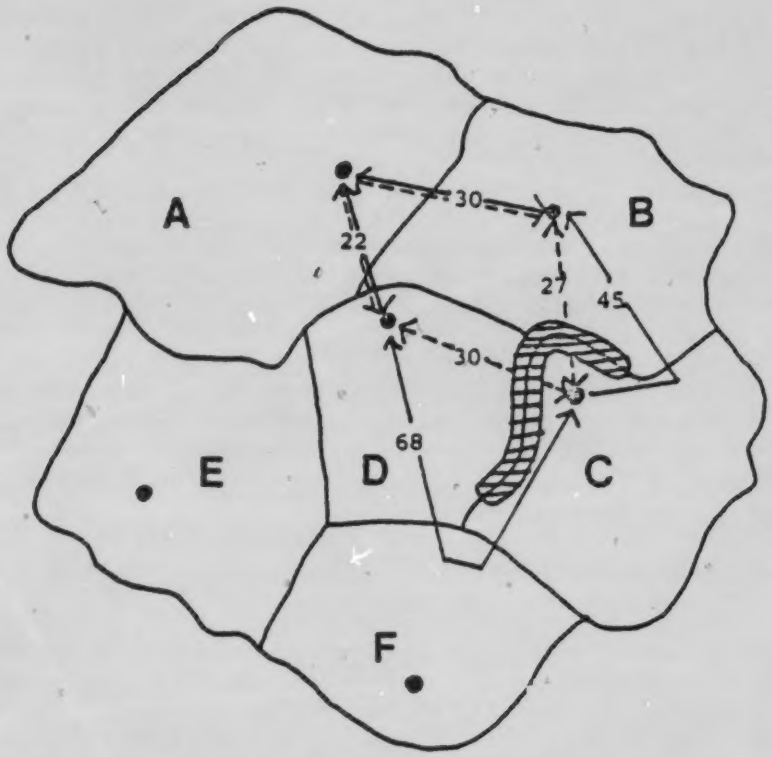
- Registered Nurse Information File, 1972
- Hospital Information File, 1972
- 1970 Census Information File

The ICDU file supports estimation algorithms that were developed because sufficiently detailed and comprehensive data on patient and nurse movements across county lines were not available. The ICDU specifies the inter-county distance for all pairs of counties to a maximum distance of 150 miles. The distance calculation was based on the county centers of population.2/ Barriers between counties were identified and the straight-line distance between the counties was adjusted by an appropriate multiplier. A graphic representation of this adjustment is presented in figure I-6.

1/ NEIS is a comprehensive geocoded nursing information data base developed by ICA under a previous contract with the Division of Nursing, HRA, PHS. It contains data through 1972 for registered nurses, licensed practical nurses, hospitals, educational institutions, and general population.

2/ "The concept of the center of population as used by the Bureau of the Census is that of a balance point, that is, the center of population is the point at which an imaginary, flat, weightless and rigid map of the United States would balance if weights of identified size were placed on it so that each weight represented the location of one person."--U.S. Bureau of the Census, Centers of Population for States and Counties, U.S. Government Printing Office, Washington, D.C., 1974.

Figure I-6.--Centers of population, distance calculation with natural barrier adjustment



LEGEND

A-F = Counties

● = Center of Population

▨ = Natural Barrier

– – – = Straight-Line Distance

——— = Estimated Travel Distance

ANSERD Service Distribution Subsystem

The service subsystem computes an estimate of the amount of nursing service available to a county's population from each of the eight delivery frameworks. The eight DFs are: short-term general hospitals, physicians' offices, nursing homes, long-term and specialty hospitals, public and community health agencies, private duty nurses, school nurses, and occupational/industrial nurses. Nursing service is measured in full-time equivalent (FTE) nurse units, and the estimate includes services available from frameworks located within the county and other counties.

In general, the subsystem defines for each framework type in a given county a service area comprised of whole county units. It then allocates the framework's services among the involved counties and distributes in like proportion to each county the nursing manpower employed in the framework type.

Framework service areas are defined either administratively or functionally. The administratively defined service area includes either the whole State or the county in which the framework is located. The functionally defined service area contains no set number or configuration of counties. Ideally, the extent of the service area would be determined from patient origin data. However, in the absence of such data, a gravitational approximation procedure was developed.

The gravitational approximation is based on the gravitational theory of the physical sciences. In terms of social or population related phenomena, the theory states that the interaction between two groups or populations is in direct proportion to the size of the groups and in inverse proportion to the distance between them. The gravitational algorithm, as developed by ICA for the ANSERD subsystem, approximates the service area and distributes the framework's services on the basis of:

- Relative distance between the centers of population of counties containing the frameworks.
- Demonstrated service capabilities of the frameworks.
- Minimum service requirements of the populations.

Thus, for a given county, the algorithm (1) defines the service area, (2) determines the amount of service the subject county receives from or renders to all other counties in the service area,

(3) translates the net service gain or loss into an FTE nurse measure, and (4) adjusts the subject county's employed FTE nurse value accordingly for the framework type.

Framework Definition and Allocation Procedures

The specific framework service area definition as well as the procedures used for allocating the nursing services were largely dictated by data availability, and are as follows:

- Short-term general hospitals: Nurses employed in hospitals classified by the American Hospital Association as "general medical and surgical" or "maternity" with a "stay code" of "s" (indicating short-term) and under control other than Federal. The gravitational distribution procedure defines the service area and allocates the nursing services.

- Physicians' offices: Nurses employed by physicians in office-based practice. Service area is defined as the county of office location. Nursing services are distributed against total county population.

- Nursing homes: Nurses employed in nursing care homes and personal care homes with nursing. Service area is defined as the entire State. Nursing services are distributed to each county in proportion to the county's population age 65 and over as a percent of the State's population age 65 and over.

- Long-term and specialty hospitals: Nurses employed in hospitals other than those included under short-term general. Service area is defined as the entire State. Nursing services are distributed to each county in proportion to the county's total population as a percent of the State's population.

- Public and community health: Nurses employed in public and community health agencies. Service area is defined as the entire State. Nursing services are distributed to each county in proportion to the county's total population as a percent of the State's population.

- Private duty nurse: A nurse indicating her employment status as private duty. Service area is defined as the county of location. Nursing services are distributed against total county population.

- School nurse: A nurse employed by a school system. Service area is defined as the county of location. Nursing services are distributed against population age 18 years and under.

- Occupational/industrial nurse: Service area is defined as the county of location. Nursing services are distributed against total State population.

Service Distribution Report

For each county the service distribution subsystem generates a one-page report summarizing for a county by the eight framework types:

- The FTE nurses employed in the county.

- The FTE nurses estimated to be available to the county's population.

- Three FTE-to-population ratios demonstrating available service for the population as a whole and two specific population subsets: the 18 years of age and under and the 65 years of age and over.

Two sample service summaries are presented. Haywood County, North Carolina, table I-1 (see below) represents a county whose residents have more nursing services available to them than are available through frameworks located within the county. Table I-2, Durham County, North Carolina, demonstrates a typical county which, on the basis of an employed FTE-to-population ratio, would appear nurse-rich. After the analysis it is apparent that much of the service available in the county is used by noncounty residents.

The service subsystem has substantially more information available in hard copy form than is output at the present time. For instance, it is possible to list for the short-term hospital framework type the counties that are the most likely contributors or consumers of services in relation to the subject county. From the data base, specific information concerning service capacity and other framework characteristics can be readily retrieved.

Table I-1

NURSING SERVICE SUMMARY FOR: STATE: NORTH CAROLINA COUNTY: HAYWOOD

FRAMEWORK TYPE (FTE EMPLOYED IN THIS COUNTY)		ESTIMATED AVAILABLE FTE	ESTIMATED FTE NURSE/100,000 POP ALL AGES	ESTIMATED FTE NURSE/100,000 POP AGE 65 AND OVER	ESTIMATED FTE NURSE/100,000 POP AGE 18 AND UNDER
SHORT-TERM GEN. HOSP.	(53)	64	153	153	153
FROM THIS COUNTY		53	127	127	127
FROM OTHER COUNTIES		11	26	26	26
PHYSICIANS OFFICES	(5)	5	11	11	11
FROM THIS COUNTY		5	11	11	11
FROM OTHER COUNTIES		0	0	0	0
NURSING HOMES	(3)	5	11	110	0
FROM THIS COUNTY		3	7	66	0
FROM OTHER COUNTIES		2	4	44	0
LONG-TERM & SPEC. HOSP.	(0)	13	31	31	31
FROM THIS COUNTY		0	0	0	0
FROM OTHER COUNTIES		13	31	31	31
PUBLIC & COMM. HEALTH	(7)	7	16	16	16
FROM THIS COUNTY		7	16	16	16
FROM OTHER COUNTIES		0	0	0	0
PRIVATE DUTY NURSING	(0)	0	0	0	0
FROM THIS COUNTY		0	0	0	0
FROM OTHER COUNTIES		0	0	0	0
SCHOOL NURSING	(0)	0	0	0	0
FROM THIS COUNTY		0	0	0	0
FROM OTHER COUNTIES		0	0	0	0
OCC./INDUST. NURSING	(7)	7	16	16	16
FROM THIS COUNTY		7	16	16	16
FROM OTHER COUNTIES		0	0	0	0
TOTAL NURSING SERVICE FROM ALL FRAMEWORKS	(75)	101	238	337	227
FROM THIS COUNTY		75	177	236	170
FROM OTHER COUNTIES		26	61	101	57

Table I-2

NURSING SERVICE SUMMARY FOR: STATE: NORTH CAROLINA COUNTY: DURHAM

FRAMEWORK TYPE (FTE EMPLOYED IN THIS COUNTY)	ESTIMATED AVAILABLE FTE	ESTIMATED FTE NURSE/100,000 POP ALL AGES	ESTIMATED FTE NURSE/100,000 POP AGE 65 AND OVER	ESTIMATED FTE NURSE/100,000 POP AGE 18 AND UNDER
SHORT-TERM GEN. HOSP. (543)	234	176	176	176
FROM THIS COUNTY	234	176	176	176
FROM OTHER COUNTIES	0	0	0	0
PHYSICIANS OFFICES (23)	23	17	17	17
FROM THIS COUNTY	23	17	17	17
FROM OTHER COUNTIES	0	0	0	0
NURSING HOMES (17)	12	9	108	0
FROM THIS COUNTY	12	9	108	0
FROM OTHER COUNTIES	0	0	0	0
LONG-TERM & SPEC. HOSP.(201)	41	30	30	30
FROM THIS COUNTY	41	30	30	30
FROM OTHER COUNTIES	0	0	0	0
PUBLIC & COMM. HEALTH (34)	24	18	18	18
FROM THIS COUNTY	24	18	18	18
FROM OTHER COUNTIES	0	0	0	0
PRIVATE DUTY NURSING (33)	33	24	24	24
FROM THIS COUNTY	33	24	24	24
FROM OTHER COUNTIES	0	0	0	0
SCHOOL NURSING (23)	23	17	0	50
FROM THIS COUNTY	23	17	0	50
FROM OTHER COUNTIES	0	0	0	0
OCC./INDUST. NURSING (26)	26	19	19	19
FROM THIS COUNTY	26	19	19	19
FROM OTHER COUNTIES	0	0	0	0
TOTAL NURSING SERVICE FROM ALL FRAMEWORKS (900)	416	310	392	334
FROM THIS COUNTY	416	310	392	334
FROM OTHER COUNTIES	0	0	0	0

ANSERD Resource Distribution Subsystem

The resource distribution subsystem computes for the county the number of registered nurses available for potential employment in its frameworks--delivery and nondelivery--from within the county and other counties.

Nursing resource to a county is defined as:

- Employed nurses in the county
- Inactive nurses in the county
- Inactive nurses in other counties of the resource area
- Employed nurses in other counties of the resource area

The resource area for a county is defined to include the county itself and all counties whose centers of population are within 25 miles of the subject county's center of population. This distance was based on the commuting patterns of members of the general work force and a limited nurse county of residence/county of employment study. The general work force study showed over 90 percent of the active labor force of a county resident in an area encompassing counties whose centers of population were within 30 miles of the center of population in which the workers were employed.3/ The registered nurse commuting pattern study revealed that nurses generally behave in a similar fashion with the exception that the distance required to account for over 90 percent of the employed nurses was 25 miles rather than 30 miles from the county of employment.4/

Resource Distribution Procedures

The resource distribution subsystem embodies three computational algorithms for estimating a county's registered nurse resource in addition to those already employed in the county.

3/ These analyses were based on data from the U.S. Bureau of the Census, Census of Population: 1970, Subject Reports, Final Report PC(2)-60, Journey to Work.

4/ Individual mailing address zip codes of employed nurses were used as a place of residence surrogate in this study. Zip codes were converted to county codes for the analysis.

The procedures for estimating the available inactive resource from the subject county and other counties of the resource area are similar. Because the exact propensity of inactive nurses to return to active status was not known, the available inactive resource is calculated using different levels of assumed nurse availability: .05, .08, .16, and .24.5/ This procedure is applied to both within county and other county inactive nurses. However, for inactive nurses in other counties, the coefficients are applied to a number which is 25 percent of the total inactive pool. This adjustment is based on the assumption that only 25 percent of the inactive nurses would be willing to travel to another county for employment.

Similar assumptions underlie the computational procedure for estimating the number of nurses employed in other counties which represent a resource for potential employment in the subject county.

These assumptions summarized below were based on the outcome of the commuting pattern analysis.

- Only 50 percent of the nurses employed in a county are also residents of that county.
- Only 50 percent of the nurses who are both employed and resident in a given county would be willing to seek employment in another county.

Therefore, only 25 percent of any county's employed nurses were assumed to be willing to seek employment in another county.

Resource Distribution Report

The resource distribution subsystem generates for each county a one-page summary showing:

- Total number of active nurses in the county (delivery and nondelivery frameworks).
- Number of counties in the resource area.
- Number of inactive nurses in the county and number potentially available for employment at the different levels of assumed availability.
- Ratio of the inactive in the county to the active in the county.

5/ These coefficients were derived from data in the Division of Nursing Registered Nurse Inventory Follow-up Study.

- Number of inactive nurses in other counties of the resource area that are potentially employable in the county at the different levels of assumed availability.

- Ratio of the inactive in other counties to active in the subject county.

- Ratio of available employed nurses from other counties of the resource area to employed nurses of the subject county.

- Comparative statistics for the subject county and other counties in the resource area.

A sample output for Haywood County, North Carolina, is presented in table I-3.

Summary

ANSERD represents a significant new tool for the analysis of registered nurse distribution and health manpower analysis in general. Its capability to assess manpower distribution at the county level of resolution without being constrained by the county boundary, using existing comprehensive nationally available data, is unprecedented. The conceptual structuring of the nursing environment in relation to the overall health care system, represented by the frameworks and the two separate distribution measures, in conjunction with the gravitational model used for estimating the inter-county flows, is capable of providing much more information than is evidenced by the summary reports that it generates. The summary reports as formatted represent a balance between detail and summary which the Division of Nursing determined best met their immediate information needs and demonstrated the model's capability.

ANSERD can be a useful tool for planning, research and program evaluation at the interstate, State, and below State level. When not constrained to produce nationally consistent estimates, more current data can be used in the data base. The coefficients used in the estimation algorithms can be adjusted to approximate the local situation more accurately, and the output reformatted to provide more detailed estimates as well as peripheral information about the estimates.

Table I-3

NURSING RESOURCE SUMMARY FOR: STATE: NORTH CAROLINA COUNTY: HAYWOOD

NURSES EMPLOYED IN THIS COUNTY: 98 NUMBER OF OTHER COUNTIES IN RESOURCE AREA: 4

INACTIVE NURSE RESOURCE SUMMARY

	TOTAL	NUMBER OF NURSES AVAILABLE AT THESE LEVELS OF ASSUMED AVAILABILITY			
THIS COUNTY		.05	.08	.16	.24
INACTIVE NURSES	19	0	1	3	4
RATIO OF INACTIVE TO ACTIVE NURSES	.1938	.0000	.0102	.0306	.0408
OTHER COUNTIES					
INACTIVE NURSES IN OTHER COUNTIES OF THE RESOURCE AREA WHO ARE POTENTIALLY EMPLOYABLE (25% OF TOTAL INACTIVE) IN THIS COUNTY	52	2	4	8	12
RATIO OF INACTIVE POTENTIAL IN OTHER COUNTIES OF THE RESOURCE AREA TO ACTIVE NURSES IN THIS COUNTY	.5306	.0204	.0408	.0816	.1224

ACTIVE NURSE RESOURCE SUMMARY

RATIO OF POTENTIALLY AVAILABLE (25% OF TOTAL EMPLOYED) NURSES EMPLOYED IN OTHER COUNTIES OF THE RESOURCE AREA TO NURSES EMPLOYED IN THIS COUNTY = 2.09180

RESOURCE AREA COMPARATIVE STATISTICS

RATIO OF NURSES (ACTIVE AND INACTIVE) IN THIS COUNTY PER 100,000 OF THIS COUNTYS POPULATION 280

RATIO OF ACTIVE NURSES IN THIS COUNTY PER 100,000 OF THIS COUNTYS POPULATION . . . . . 234 RATIO BASIS FTE: 191

RATIO OF ACTIVE NURSES IN OTHER COUNTIES OF THE RESOURCE AREA PER 100,000 OF THOSE COUNTIES POPULATION . . . . . 406 RATIO BASIS FTE: 336

THIS COUNTYS POPULATION AS A PERCENT OF THE POPULATION IN OTHER COUNTIES OF THE RESOURCE AREA . . . 20.61%

STATE: COUNTY FIPS CODE: 37; 087

APPENDIX II

Tables

Table II-1.--Number of registered nurses in each State and the District of Columbia, by region, 1972, 1976, and 1980

State	1972	1976	1980
New England			
Connecticut	17,580	19,529	21,750
Maine	4,753	5,380	6,699
Massachusetts	36,944	44,088	53,284
New Hampshire	4,382	5,196	6,118
Rhode Island	4,633	5,453	6,725
Vermont	2,809	3,500	4,377
Middle Atlantic			
New Jersey	31,347	37,055	43,521
New York	87,551	104,141	122,109
Pennsylvania	60,885	71,259	81,612
South Atlantic			
Delaware	2,889	3,825	5,376
District of Columbia	4,873	6,065	7,785
Florida	25,770	31,603	39,313
Georgia	12,282	18,172	28,643
Maryland	14,533	18,979	25,054
North Carolina	16,384	20,935	27,752
South Carolina	7,802	9,893	13,424
Virginia	16,364	21,368	27,943
West Virginia	6,176	7,913	10,300
East South Central			
Alabama	7,721	10,477	14,248
Kentucky	8,342	11,365	15,913
Mississippi	5,052	7,016	10,185
Tennessee	9,287	12,903	18,846
West South Central			
Arkansas	3,716	5,577	8,338
Louisiana	8,936	11,249	14,644
Oklahoma	6,407	8,676	11,730
Texas	27,598	37,961	52,850
East North Central			
Illinois	43,960	52,254	62,917
Indiana	15,555	10,101	23,912
Michigan	30,015	37,433	45,314
Ohio	41,378	49,735	59,597
Wisconsin	18,545	23,002	28,754
West North Central			
Iowa	11,790	13,906	16,636
Kansas	8,938	11,084	13,526
Minnesota	18,790	22,987	26,817
Missouri	14,703	18,447	22,559
Nebraska	6,676	8,509	9,982
North Dakota	2,839	3,628	4,080
South Dakota	3,096	4,072	5,057
Mountain			
Arizona	8,332	11,481	15,432
Colorado	11,487	14,673	17,804
Idaho	2,474	3,308	4,053
Montana	3,194	3,816	4,673
Nevada	1,697	2,414	3,545
New Mexico	2,715	3,453	4,645
Utah	3,172	4,215	5,357
Wyoming	1,450	1,727	2,043
Pacific			
Alaska	1,362	2,511	4,734
California	67,064	79,139	90,850
Hawaii	3,036	3,715	4,483
Oregon	8,593	10,789	12,665
Washington	14,121	17,726	21,499

Source: Projections of nurse supply prepared by Western Interstate Commission for Higher Education.

Table II-2.--Average annual percent increase of registered nurse supply in each State and the District of Columbia, by region, 1966-72 and 1976-80

State	Average annual percent increase in nurse supply 1966-72[1/]	Average annual percent increase in estimated nurse supply 1976-80[2/]
New England		
Connecticut	1.9	2.7
Maine	2.2	5.6
Massachusetts	4.0	4.9
New Hampshire	3.2	4.2
Rhode Island	3.6	5.4
Vermont	6.9	5.7
Middle Atlantic		
New Jersey	3.6	4.1
New York	2.6	4.1
Pennsylvania	4.5	3.4
South Atlantic		
Delaware	5.1	8.9
District of Columbia	5.1	6.4
Florida	2.7	5.6
Georgia	9.6	12.0
Maryland	6.3	7.2
North Carolina	4.8	7.3
South Carolina	5.1	7.9
Virginia	5.7	6.9
West Virginia	4.2	6.6
East South Central		
Alabama	4.3	8.0
Kentucky	4.5	8.8
Mississippi	5.1	9.8
Tennessee	5.1	9.9
West South Central		
Arkansas	5.7	10.6
Louisiana	4.7	6.8
Oklahoma	5.2	7.8
Texas	5.3	8.6
East North Central		
Illinois	3.3	4.8
Indiana	3.0	5.8
Michigan	3.9	4.9
Ohio	3.7	4.6
Wisconsin	4.4	5.7
West North Central		
Iowa	2.5	4.6
Kansas	4.2	5.1
Minnesota	4.3	3.9
Missouri	4.3	5.1
Nebraska	5.6	4.1
North Dakota	4.7	3.0
South Dakota	6.5	5.6
Mountain		
Arizona	5.7	7.7
Colorado	5.5	5.0
Idaho	4.0	5.2
Montana	4.1	5.2
Nevada	7.9	10.1
New Mexico	1.2	7.7
Utah	5.3	6.2
Wyoming	2.6	4.3
Pacific		
Alaska	15.0	17.2
California	2.2	3.5
Hawaii	4.4	4.8
Oregon	4.0	4.1
Washington	3.7	4.9

1/ Based on data in 1966 and 1972 Inventories of Registered Nurses adjusted for national estimates of nurse supply.
2/ Based on projections of nurse supply prepared by Western Interstate Commission for Higher Education.

Table II-3.--Estimated ratio of registered nurses per 100,000 population in each State and the District of Columbia, by region, 1972, 1976, and 1980

State	1972[1/]	1976	1980
New England			
Connecticut	565	605	648
Maine	479	549	689
Massachusetts	634	730	850
New Hampshire	574	648	726
Rhode Island	478	546	652
Vermont	617	748	908
Middle Atlantic			
New Jersey	424	480	539
New York	473	551	631
Pennsylvania	525	578	645
South Atlantic			
Delaware	510	643	857
District of Columbia	645	807	1038
Florida	355	393	440
Georgia	260	369	557
Maryland	359	446	560
North Carolina	313	383	484
South Carolina	295	363	476
Virginia	342	425	528
West Virginia	350	444	562
East South Central			
Alabama	219	289	380
Kentucky	252	329	441
Mississippi	225	308	438
Tennessee	228	300	414
West South Central			
Arkansas	189	276	400
Louisiana	243	304	391
Oklahoma	245	323	425
Texas	241	322	434
East North Central			
Illinois	387	446	520
Indiana	292	344	413
Michigan	330	398	465
Ohio	379	442	512
Wisconsin	412	499	607
West North Central			
Iowa	413	483	571
Kansas	398	497	607
Minnesota	483	575	651
Missouri	308	376	445
Nebraska	447	570	666
North Dakota	465	612	705
South Dakota	466	619	772
Mountain			
Arizona	445	561	693
Colorado	500	602	688
Idaho	345	465	572
Montana	462	562	698
Nevada	328	427	575
New Mexico	264	333	440
Utah	291	375	462
Wyoming	434	520	617
Pacific			
Alaska	438	782	1422
California	327	369	406
Hawaii	389	457	529
Oregon	399	482	542
Washington	409	507	606

1/ These will differ from those in the 1972 Inventory of Registered Nurses because of adjustments in nurse supply to take account of national estimated supply and the use of a different series of population estimates than was used in the 1972 Inventory of Registered Nurses.

Source: Based on projections of nurse supply prepared by Western Interstate Commission for Higher Education and estimated population for each State prepared by Bureau of Economic Analysis, U.S. Department of Commerce, Series E, April 1974.

Table II-4.--Number of licensed practical nurses in each State, by region, 1974 and 1980

State	1974	1980
New England		
Connecticut	6,431	7,629
Maine	2,073	3,322
Massachusetts	14,776	15,379
New Hampshire	1,687	1,923
Rhode Island	2,516	3,377
Vermont	1,408	1,805
Middle Atlantic		
New Jersey	16,083	24,421
New York	36,519	41,247
Pennsylvania	27,069	28,022
South Atlantic		
Delaware	923	1,098
District of Columbia	2,590	2,577
Florida	14,082	17,137
Georgia	11,913	19,689
Maryland	5,765	8,234
North Carolina	9,831	12,524
South Carolina	5,090	7,969
Virginia	9,882	13,418
West Virginia	3,870	4,803
East South Central		
Alabama	9,248	12,365
Kentucky	5,758	7,591
Mississippi	5,200	7,460
Tennessee	13,121	17,642
West South Central		
Arkansas	5,515	6,805
Louisiana	8,321	11,284
Oklahoma	6,036	8,721
Texas	35,629	42,310
East North Central		
Illinois	16,918	19,788
Indiana	7,117	10,360
Michigan	19,605	23,049
Ohio	26,607	35,577
Wisconsin	8,757	11,988
West North Central		
Iowa	6,164	8,314
Kansas	3,507	4,937
Minnesota	10,499	13,782
Missouri	10,374	12,604
Nebraska	3,135	4,537
North Dakota	1,533	1,580
South Dakota	1,304	1,501
Mountain		
Arizona	3,613	5,517
Colorado	4,953	5,615
Idaho	2,197	2,654
Montana	1,558	2,490
Nevada	1,090	1,358
New Mexico	1,979	2,695
Utah	1,889	2,504
Wyoming	535	815
Pacific		
Alaska	440	612
California	39,132	55,099
Hawaii	1,875	2,089
Oregon	3,418	4,565
Washington	7,050	7,940

Source: Based on projections of nurse supply prepared by Western Interstate Commission for Higher Education.

Table II-5.--Average annual percent increase of licensed practical nurse supply in each State and the District of Columbia, by region, 1967-74 and 1974-80

State	Average annual percent increase in LPN supply 1967-74	Average annual percent increase in estimated LPN supply 1974-80
New England		
Connecticut	7.3	2.9
Maine	15.4	8.2
Massachusetts	1.1	.7
New Hampshire	6.1	2.2
Rhode Island	4.9	5.0
Vermont	4.2	4.2
Middle Atlantic		
New Jersey	8.8	7.2
New York	3.9	2.0
Pennsylvania	-	.6
South Atlantic		
Delaware	3.5	2.9
District of Columbia	1.2	- .1
Florida	4.0	2.8
Georgia	15.6	8.7
Maryland	7.9	6.1
North Carolina	7.4	4.1
South Carolina	10.9	7.8
Virginia	9.1	5.2
West Virginia	5.6	3.7
East South Central		
Alabama	9.5	5.0
Kentucky	8.7	4.7
Mississippi	6.5	6.2
Tennessee	10.9	5.1
West South Central		
Arkansas	5.5	3.6
Louisiana	5.9	5.2
Oklahoma	7.1	6.3
Texas	10.9	5.1
East North Central		
Illinois	3.4	2.6
Indiana	10.5	6.5
Michigan	5.9	2.7
Ohio	7.0	4.9
Wisconsin	10.3	5.4
West North Central		
Iowa	12.6	5.1
Kansas	7.7	5.9
Minnesota	9.5	4.6
Missouri	4.7	3.3
Nebraska	13.5	6.4
North Dakota	12.6	.5
South Dakota	8.9	2.4
Mountain		
Arizona	9.5	7.3
Colorado	2.8	2.1
Idaho	4.7	3.2
Montana	13.3	8.1
Nevada	8.7	3.7
New Mexico	6.1	5.3
Utah	5.1	4.8
Wyoming	8.1	7.3
Pacific		
Alaska	10.5	5.7
California	8.5	5.9
Hawaii	3.7	1.8
Oregon	5.2	4.9
Washington	4.1	2.0

Source: Based on projections of nurse supply prepared by Western Interstate Commission for Higher Education.

Table II-6.--Ratio of licensed practical nurses per 100,000 population in each State and the District of Columbia, by region, 1974 and 1980

State	1974	1980
New England		
Connecticut	203	227
Maine	211	342
Massachusetts	250	245
New Hampshire	216	228
Rhode Island	256	327
Vermont	305	374
Middle Atlantic		
New Jersey	213	302
New York	196	213
Pennsylvania	222	222
South Atlantic		
Delaware	159	175
District of Columbia	344	344
Florida	185	192
Georgia	248	383
Maryland	139	184
North Carolina	184	218
South Carolina	190	283
Virginia	202	253
West Virginia	218	262
East South Central		
Alabama	259	330
Kentucky	171	210
Mississippi	230	320
Tennessee	314	387
West South Central		
Arkansas	278	326
Louisiana	226	301
Oklahoma	228	316
Texas	307	348
East North Central		
Illinois	147	164
Indiana	131	179
Michigan	212	237
Ohio	241	305
Wisconsin	192	253
West North Central		
Iowa	216	285
Kansas	157	222
Minnesota	265	335
Missouri	214	249
Nebraska	210	303
North Dakota	256	273
South Dakota	198	229
Mountain		
Arizona	185	248
Colorado	210	217
Idaho	309	375
Montana	228	372
Nevada	202	220
New Mexico	192	255
Utah	171	216
Wyoming	161	246
Pacific		
Alaska	139	184
California	187	246
Hawaii	236	246
Oregon	156	196
Washington	204	224

Source: Based on projections of nurse supply prepared by Western Interstate Commission for Higher Education. Estimated population of each State prepared by U.S. Department of Commerce, Bureau of Economic Analysis.

Table II-7.--Estimated percentage distribution of registered nurses in each State and the District of Columbia by educational preparation, by region, 1972, 1976, and 1980

State	1972			1976			1980		
	Dip. & AD	Bacc.	Grad.	Dip. & AD	Bacc.	Grad.	Dip. & AD	Bacc.	Grad.
New England									
Connecticut	85.4	11.5	3.1	82.1	14.0	3.8	76.3	18.9	4.8
Maine	92.3	6.1	1.6	88.9	9.3	1.9	83.8	14.3	2.0
Massachusetts	84.7	11.5	3.8	81.3	15.0	3.6	74.5	22.0	3.4
New Hampshire	89.6	8.5	1.9	83.9	13.9	2.1	79.5	18.1	2.4
Rhode Island	86.2	10.7	3.1	81.2	14.9	3.9	71.1	24.1	4.8
Vermont	86.7	10.5	2.8	82.9	13.7	3.5	79.2	16.5	4.2
Middle Atlantic									
New Jersey	83.4	13.5	3.0	79.2	17.2	3.6	73.6	22.2	4.2
New York	81.7	13.7	4.7	78.9	16.3	4.8	74.0	21.1	4.9
Pennsylvania	85.8	11.5	2.7	81.7	15.1	3.2	76.4	19.9	3.7
South Atlantic									
Delaware	87.1	10.3	2.6	79.3	16.8	3.9	69.0	25.9	5.2
District of Columbia	71.5	19.5	9.0	66.5	25.5	8.0	60.2	33.1	6.7
Florida	86.1	11.6	2.3	86.1	11.3	2.6	86.5	10.8	2.8
Georgia	86.0	10.6	3.4	83.1	14.0	2.9	74.0	23.8	2.2
Maryland	80.7	14.6	4.7	76.8	18.2	5.0	70.0	24.9	5.1
North Carolina	86.9	10.8	2.3	82.2	15.2	2.6	76.0	21.3	2.8
South Carolina	88.8	9.2	2.0	83.2	14.0	2.8	76.0	20.3	3.8
Virginia	85.2	12.8	2.0	81.6	15.9	2.5	77.5	19.4	3.1
West Virginia	91.4	6.8	1.7	90.2	8.0	1.8	88.9	9.2	1.9
East South Central									
Alabama	86.9	10.4	2.7	84.8	12.0	3.3	76.0	20.3	3.7
Kentucky	85.4	11.9	2.7	82.8	13.8	3.4	77.4	18.4	4.2
Mississippi	88.3	9.5	2.2	83.8	13.1	3.2	74.4	21.5	4.1
Tennessee	85.9	11.3	2.8	82.9	13.3	3.8	74.1	21.3	4.6
West South Central									
Arkansas	87.3	10.9	1.9	85.8	11.4	2.8	85.1	11.2	3.7
Louisiana	79.0	18.7	2.3	75.2	22.1	2.7	70.5	26.5	3.0
Oklahoma	86.0	12.0	2.0	79.9	17.6	2.5	77.1	19.8	3.2
Texas	78.9	18.3	2.8	73.5	22.5	4.1	66.5	28.1	5.4
East North Central									
Illinois	83.6	13.8	2.6	79.1	17.6	3.3	72.9	23.1	4.0
Indiana	84.2	12.8	3.0	81.0	16.0	3.0	77.8	19.2	3.0
Michigan	85.0	12.2	2.8	82.6	14.7	2.7	78.2	19.2	2.7
Ohio	87.3	10.4	2.3	84.9	12.6	2.6	81.2	15.9	2.8
Wisconsin	83.9	13.6	2.5	77.3	19.4	3.3	71.3	24.6	4.1

Table II-7.--Estimated percentage distribution of registered nurses in each State and the District of Columbia by educational preparation, by region, 1972, 1976, and 1980--continued

State	1972			1976			1980		
	Dip. & AD	Bacc.	Grad.	Dip. & AD	Bacc.	Grad.	Dip. & AD	Bacc.	Grad.
West North Central									
Iowa	88.9	9.6	1.5	85.0	12.8	2.2	82.0	15.1	2.9
Kansas	84.2	13.8	2.0	79.9	17.5	2.6	74.9	21.7	3.4
Minnesota	81.5	16.1	2.4	78.8	18.9	2.3	75.2	22.6	2.2
Missouri	83.4	13.6	3.0	81.5	15.5	3.0	78.1	19.1	2.9
Nebraska	83.0	14.9	2.1	81.0	16.1	2.8	78.9	17.0	4.1
North Dakota	86.1	12.3	1.7	81.1	17.2	1.7	82.1	16.0	1.9
South Dakota	84.9	12.9	2.2	81.9	15.9	2.2	82.5	15.2	2.2
Mountain									
Arizona	80.2	15.8	4.1	73.5	19.9	6.6	65.2	24.6	10.2
Colorado	75.2	20.6	4.3	71.8	23.4	4.9	68.4	26.1	5.5
Idaho	85.1	13.3	1.6	85.7	12.7	1.6	86.1	12.2	1.7
Montana	80.0	17.3	2.6	75.5	22.0	2.5	71.8	25.7	2.4
Nevada	81.2	15.5	3.3	77.4	18.8	3.7	73.6	22.3	4.2
New Mexico	78.2	19.0	2.8	74.1	23.6	2.3	70.5	27.8	1.8
Utah	73.3	21.6	5.1	68.4	25.1	6.5	59.0	33.0	8.0
Wyoming	81.3	15.7	3.0	72.3	20.7	7.0	61.0	23.3	15.7
Pacific									
Alaska	72.7	23.3	4.0	64.7	29.9	5.4	55.3	37.7	7.0
California	77.2	19.1	3.7	73.6	22.5	3.9	71.1	24.6	4.3
Hawaii	75.2	20.6	4.3	71.1	23.8	5.1	66.9	26.6	6.5
Oregon	77.3	21.4	1.4	75.9	22.9	1.2	76.3	22.7	1.1
Washington	75.5	20.5	4.0	72.2	24.2	3.6	68.7	28.0	3.3

Source: Estimates of the educational composition of RNs prepared by the Western Interstate Commission for Higher Education.

Table II-8.--Employment status of registered nurses in each State and region, 1972

State and region	Total		Employed in nursing										Not employed in nursing		Employment status not reported	
			Total employed		Full time		Regular part time		Irregular part time		Full or part time not reported					
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
United States	1,127,657	100.0	778,470	69.0	505,201	44.8	159,609	14.1	78,591	7.0	35,069	3.1	316,611	28.1	32,576	2.9
New England	105,822	100.0	69,869	66.0	37,957	35.9	21,964	20.7	6,741	6.4	3,207	3.0	30,319	28.7	5,634	5.3
Connecticut	23,612	100.0	17,567	74.4	8,439	35.7	6,116	25.9	1,414	6.0	1,598	6.8	5,530	23.4	515	2.2
Maine	7,440	100.0	4,700	63.2	2,630	35.4	1,367	18.4	479	6.4	224	3.0	2,493	33.5	247	3.3
Massachusetts	56,567	100.0	35,755	63.2	20,009	35.4	11,459	20.2	3,437	6.1	850	1.5	16,333	28.9	4,479	7.9
New Hampshire	7,044	100.0	4,388	62.3	2,554	36.3	835	11.8	699	9.9	300	4.3	2,469	35.0	187	2.7
Rhode Island	6,638	100.0	4,631	69.8	2,602	39.2	1,466	22.1	427	6.4	136	2.1	1,867	28.1	140	2.1
Vermont	4,521	100.0	2,828	62.5	1,723	38.1	721	15.9	285	6.3	99	2.2	1,627	36.0	66	1.5
Middle Atlantic	273,269	100.0	178,910	65.5	109,441	40.1	43,289	15.8	18,525	6.8	7,655	2.8	86,713	31.7	7,646	2.8
New Jersey	51,061	100.0	30,973	60.6	18,018	35.3	8,617	16.9	3,617	7.1	2,721	5.3	17,902	35.1	2,186	4.3
New York	125,794	100.0	89,072	70.8	57,722	45.9	20,750	16.5	8,403	6.7	2,197	1.7	36,023	28.6	699	0.6
Pennsylvania	96,414	100.0	58,865	61.1	35,701	37.0	13,922	14.5	6,505	6.8	2,737	2.8	32,788	34.0	4,761	4.9
South Atlantic	151,019	100.0	107,116	70.9	72,537	48.0	15,9 5	10.6	11,898	7.9	6,696	4.4	39,900	26.4	4,003	2.7
Delaware	4,389	100.0	2,886	65.8	1,672	38.1	609	13.9	328	7.5	277	6.3	1,424	32.4	79	1.8
Dist. of Columbia	5,545	100.0	4,968	89.6	3,641	65.7	633	11.4	445	8.0	249	4.5	519	9.4	58	1.0
Florida	38,398	100.0	25,498	66.4	17,847	46.5	2,950	7.7	3,400	8.8	1,301	3.4	11,058	28.8	1,842	4.8
Georgia	17,423	100.0	12,353	70.9	9,364	53.8	1,530	8.8	1,033	5.9	426	2.4	4,836	27.8	234	1.3
Maryland	22,462	100.0	14,596	65.0	9,172	40.8	3,461	15.4	1,633	7.3	330	1.5	7,152	31.8	714	3.2
North Carolina	21,366	100.0	16,573	77.6	10,974	51.4	1,995	9.3	1,639	7.7	1,965	9.2	4,660	21.8	133	0.6
South Carolina	10,187	100.0	7,790	76.5	5,555	54.5	973	9.6	792	7.8	470	4.6	2,141	21.0	256	2.5
Virginia	23,935	100.0	16,472	68.8	10,179	42.5	2,935	12.3	2,045	8.5	1,313	5.5	7,140	29.8	323	1.4
West Virginia	,,314	100.0	5,980	81.7	4,133	56.5	899	12.3	583	7.9	365	5.0	970	13.3	364	5.0
East South Central	40,308	100.0	30,624	[illegible]	21,968	54.5	3,592	8.9	2,805	7.0	2,259	5.6	9,216	22.9	468	1.1
Alabama	10,235	100.0	7,753	[illegible]	5,410	52.9	914	8.9	674	5.6	855	8.3	2,361	23.1	121	1.2
Kentucky	11,734	100.0	8,432	[illegible]	5,673	48.3	1,427	12.2	747	6.4	585	5.0	3,157	26.9	145	1.2
Mississippi	6,288	100.0	5,101	[illegible]	4,211	67.0	85	1.3	747	11.9	58	0.9	1,140	18.1	47	0.8
Tennessee	12,051	100.0	9,338	[illegible]	6,674	55.4	1,166	9.7	737	6.1	761	6.3	2,558	21.2	155	1.3
West South Central	65,627	100.0	47,233	72.0	33,837	51.6	6,128	9.3	3,612	5.5	3,656	5.6	17,722	27.0	672	1.0
Arkansas	5,033	100.0	3,757	74.6	2,637	52.4	528	10.5	289	5.7	303	6.0	1,216	24.2	60	1.2
Louisiana	11,524	100.0	9,070	78.7	6,200	53.8	1,148	10.0	806	7.0	916	7.9	2,351	20.4	103	0.9
Oklahoma	8,698	100.0	6,496	74.7	4,858	55.8	928	10.7	492	5.7	218	2.5	2,161	24.8	41	0.5
Texas	40,372	100.0	27,910	69.1	20,142	49.9	3,524	8.7	2,025	5.0	2,219	5.5	11,994	29.7	468	1.2
East North Central	209,338	100.0	148,842	71.1	102,440	48.9	30,489	14.6	12,894	6.2	3,019	1.4	53,483	25.5	7,013	3.4
Illinois	60,806	100.0	44,223	72.7	28,446	46.8	10,304	16.9	4,669	7.7	804	1.3	15,726	25.9	857	1.4
Indiana	21,481	100.0	15,539	72.3	9,759	45.4	3,672	17.1	1,800	8.4	308	1.4	4,955	23.1	987	4.6
Michigan	46,681	100.0	29,923	64.1	17,686	37.9	8,285	17.8	2,769	5.9	1,183	2.5	13,998	30.0	2,760	5.9
Ohio	57,052	100.0	40,308	70.7	36,609	64.2	1,417	2.5	1,962	3.4	320	0.6	14,396	25.2	2,348	4.1
Wisconsin	23,318	100.0	18,849	80.8	9,940	42.6	6,811	29.2	1,694	7.3	404	1.7	4,408	18.9	61	0.3

Table II-8.--Employment status of registered nurses in each State and region, 1972--continued

State and region	Total		Employed in nursing													
			Total employed		Full time		Regular part time		Irregular part time		Full or part time not reported		Not employed in nursing		Employment status not reported	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
West NorthCentral	90,231	100.0	66,356	73.5	38,997	43.2	16,383	18.1	7,553	8.4	3,423	3.8	21,278	23.6	2,597	2.9
Iowa	17,812	100.0	11,925	67.0	7,034	39.5	3,234	18.2	1,461	8.2	196	1.1	5,810	32.6	77	0.4
Kansas	12,655	100.0	8,961	70.8	5,738	45.3	1,861	14.7	803	6.4	559	4.4	3,511	27.7	183	1.5
Minnesota	23,638	100.0	18,222	77.1	9,966	42.2	5,307	22.4	2,453	10.4	496	2.1	3,864	16.3	1,552	6.6
Missouri	18,823	100.0	14,721	78.2	9,193	48.8	2,957	15.7	1,383	7.4	1,188	6.3	3,778	20.1	324	1.7
Nebraska	9,798	100.0	6,649	67.9	3,806	38.9	1,621	16.5	702	7.2	520	5.3	2,914	29.7	235	2.4
North Dakota	3,653	100.0	2,853	78.1	1,698	46.5	617	16.9	407	11.1	131	3.6	738	20.2	62	1.7
South Dakota	3,852	100.0	3,025	78.5	1,562	40.6	786	20.4	344	8.9	333	8.6	663	17.2	164	4.3
Mountain	49,176	100.0	33,950	69.0	24,483	49.8	4,911	10.0	3,629	7.3	927	1.9	13,101	26.7	2,125	4.3
Arizona	12,383	100.0	7,418	59.9	6,855	55.4	277	2.2	177	1.4	109	0.9	3,405	27.5	1,560	12.6
Colorado	15,515	100.0	11,634	75.0	7,869	50.7	1,907	12.3	1,430	9.2	428	2.8	3,567	23.0	314	2.0
Idaho	3,755	100.0	2,504	66.7	1,582	42.1	516	13.8	375	10.0	31	0.8	1,216	32.4	35	0.9
Montana	4,429	100.0	3,246	73.3	1,836	41.4	836	18.9	443	10.0	131	3.0	1,150	26.0	33	0.7
Nevada	2,564	100.0	1,718	67.0	1,331	51.9	220	8.6	137	5.3	30	1.2	816	31.8	30	1.2
New Mexico	4,077	100.0	2,755	67.6	2,005	49.2	96	2.3	565	13.9	89	2.2	1,277	31.3	45	1.1
Utah	4,531	100.0	3,205	70.7	2,061	45.5	692	15.3	363	8.0	89	1.9	1,232	27.2	94	2.1
Wyoming	1,922	100.0	1,470	76.5	944	49.1	367	19.1	139	7.2	20	1.1	438	22.8	14	0.7
Pacific	142,867	100.0	95,570	66.9	63,541	44.5	16,868	11.8	10,934	7.6	4,227	3.0	44,879	31.4	2,418	1.7
Alaska	2,030	100.0	1,373	67.6	943	46.5	183	9.0	179	8.8	68	3.3	617	30.4	40	2.0
California	103,385	100.0	68,118	65.9	45,950	44.4	11,513	11.1	7,390	7.2	3,265	3.2	33,733	32.6	1,534	1.5
Hawaii	4,117	100.0	3,074	74.7	2,437	59.2	229	5.6	229	5.6	179	4.3	988	24.0	55	1.3
Oregon	11,382	100.0	8,739	76.8	5,388	47.4	1,890	16.6	1,313	11.5	148	1.3	2,558	22.5	85	0.7
Washington	21,953	100.0	14,266	65.0	8,823	40.2	3,053	13.9	1,823	8.3	567	2.6	6,983	31.8	704	3.2

Source: Roth, Aleda V., and Walden, Alice R. The Nation's Nurses: 1972 Inventory of Registered Nurses. Kansas City, American Nurses' Association, 1974.

Table II-9.--Employment status of licensed practical nurses in each State and region, 1974

State and region	Total		Employed in nursing													
			Total employed		Full time		Regular part time		Irregular part time		Full or part time not reported		Not employed in nursing		Employment status not reported	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
United States	533,459	100.0	377,889	70.9	276,947	51.9	46,158	8.7	42,775	8.0	12,009	2.3	113,689	21.3	41,881	7.8
New England	36,320	100.0	25,284	69.6	16,397	45.1	5,867	16.2	2,681	7.4	339	.9	8,663	23.9	2,373	6.5
Connecticut	7,198	100.0	5,610	78.0	3,633	50.5	1,763	24.5	200	2.8	14	.2	1,263	17.5	325	4.5
Maine	2,589	100.0	1,865	72.1	1,189	45.9	342	13.3	321	12.4	13	.5	669	25.8	55	2.1
Massachusetts	19,387	100.0	12,799	66.0	8,398	43.3	2,672	13.8	1,530	7.9	199	1.0	4,753	24.5	1,835	9.5
New Hampshire	2,211	100.0	1,500	67.8	968	43.8	245	11.1	251	11.3	36	1.6	640	29.0	71	3.2
Rhode Island	2,990	100.0	2,239	74.9	1,359	45.5	601	20.1	228	7.6	51	1.7	694	23.2	57	1.9
Vermont	1,945	100.0	1,271	65.4	850	43.7	244	12.6	151	7.8	26	1.3	644	33.1	30	1.5
Middle Atlantic	102,165	100.0	66,139	64.7	48,136	47.1	10,030	9.8	7,399	7.2	574	.6	26,975	26.4	9,051	8.9
New Jersey	20,789	100.0	9,104	43.8	6,448	31.0	1,596	7.8	1,025	4.9	35	.1	3,725	17.9	7,960	38.3
New York	45,798	100.0	32,817	71.6	23,386	51.0	5,103	11.1	3,926	8.6	402	.9	12,436	27.2	545	1.2
Pennsylvania	35,578	100.0	24,218	68.1	18,302	51.4	3,331	9.4	2,448	6.9	137	.4	10,814	30.4	546	1.5
South Atlantic	73,733	100.0	54,059	73.3	36,219	49.1	3,431	4.6	5,664	7.7	8,747	11.9	14,430	19.6	5,244	7.1
Delaware	1,165	100.0	823	70.7	605	52.0	96	8.2	120	10.3	2	.2	309	26.5	33	2.8
Dist. of Columbia	2,655	100.0	2,297	86.5	1,919	72.3	107	4.0	230	8.7	41	1.5	297	11.2	61	2.3
Florida	17,130	100.0	12,313	71.9	9,225	53.8	889	5.2	2,018	11.8	181	1.1	4,229	24.7	588	3.4
Georgia	13,721	100.0	7,822	57.0	6,610	48.2	467	3.4	696	5.0	49	.4	2,036	14.8	3,863	28.2
Maryland	6,814	100.0	5,098	74.8	3,976	58.3	592	8.7	496	7.3	34	.5	1,514	22.2	202	3.0
North Carolina	11,114	100.0	8,851	79.6	461	4.2	58	.5	116	1.0	8,218	73.9	2,167	19.5	96	.9
South Carolina	5,476	100.0	4,496	82.1	3,610	65.9	343	6.3	415	7.6	128	2.3	803	14.7	177	3.2
Virginia	11,260	100.0	8,928	79.3	7,031	62.4	696	6.2	1,154	10.3	47	.4	2,224	19.7	108	1.0
West Virginia	4,398	100.0	3,431	78.0	2,782	63.2	183	4.2	419	9.5	47	1.1	851	19.4	116	2.6
East South Central	36,704	100.0	27,617	75.2	22,687	61.8	1,809	4.9	2,328	6.3	793	2.2	5,802	15.8	3,285	9.0
Alabama	10,056	100.0	8,217	81.7	6,848	68.1	483	4.8	508	5.0	378	3.8	1,620	16.1	219	2.2
Kentucky	6,624	100.0	5,146	77.7	4,136	62.5	250	3.7	564	8.5	196	3.0	1,365	20.6	113	1.7
Mississippi	5,641	100.0	4,702	83.4	3,796	67.3	360	6.4	433	7.7	113	2.0	892	15.8	47	.8
Tennessee	14,383	100.0	9,552	66.4	7,907	55.0	716	5.0	823	5.7	106	.7	1,925	13.4	2,906	20.2
West South Central	65,939	100.0	49,434	75.0	40,809	62.0	2,113	3.2	6,411	9.7	101	.1	14,116	21.4	2,389	3.6
Arkansas	6,530	100.0	4,959	76.0	4,023	61.6	362	5.6	551	8.4	23	.4	1,492	22.8	79	1.2
Louisiana	9,416	100.0	7,460	79.2	5,635	59.8	453	4.8	1,326	14.1	46	.5	1,778	18.9	178	1.9
Oklahoma	7,080	100.0	5,462	77.2	4,591	64.8	586	8.3	280	4.0	5	.1	1,560	22.0	58	.8
Texas	42,913	100.0	31,553	73.5	26,560	42.9	712	1.6	4,254	9.9	27	.1	9,286	21.7	2,074	4.8

Table II-9.--Employment status of licensed practical nurses in each State and region, 1974--continued

State and region	Total		Employed in nursing										Not employed in nursing		Employment status not reported	
			Total employed		Full time		Regular part time		Irregular part time		Full or part time not reported					
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
East North Central	91,312	100.0	70,371	77.0	50,149	54.9	12,133	13.3	7,685	8.4	404	.4	17,957	19.7	2,984	3.3
Illinois	18,564	100.0	15,173	81.7	11,259	60.6	1,439	7.8	2,264	12.2	211	1.1	3,082	16.6	309	1.7
Indiana	8.051	100.0	6,200	77.0	4,515	56.1	542	6.8	1,117	13.8	26	.3	1,372	7.1	479	5.9
Michigan	25,419	100.0	17,479	68.8	12,170	47.9	3,180	12.5	2,119	8.3	10	.1	6,528	25.7	1,412	5.5
Ohio	29,956	100.0	23,585	78.7	17,238	57.5	5,059	16.9	1,138	3.8	150	.5	5,624	18.8	747	2.5
Wisconsin	9,322	100.0	7,934	85.1	4,967	53.3	1,913	20.5	1,047	11.2	7	.1	1,351	14.5	37	.4
West North Central	40,600	100.0	32,154	79.2	22,349	55.1	5,253	12.9	3,879	9.5	673	1.7	7,069	17.4	1,377	3.4
Iowa	7,100	100.0	5,571	78.5	3,836	54.0	1,184	16.7	527	7.4	24	.4	1,485	20.9	44	.6
Kansas	4,170	100.0	3,140	75.3	2,469	59.2	254	6.1	292	7.0	125	3.0	888	21.3	142	3.4
Minnesota	11,477	100.0	9,092	79.2	5,504	48.0	2,027	17.6	1,503	13.1	58	.5	1,820	15.9	565	4.9
Missouri	10,809	100.0	8,973	83.0	6,629	61.3	951	8.8	960	8.9	433	4.0	1,324	12.3	512	4.7
Nebraska	3,800	100.0	2,805	73.8	2,085	54.9	480	12.6	220	5.8	20	.5	904	23.8	91	2.4
North Dakota	1,741	100.0	1,392	80.0	974	55.9	167	9.6	243	14.0	8	.5	336	19.3	13	.7
South Dakota	1,503	100.0	1,181	78.6	852	56.7	190	12.7	134	8.9	5	.3	312	20.8	10	.6
Mountain	22,165	100.0	15,773	71.1	11,846	53.4	1,581	7.1	2,234	10.1	112	.5	5,437	24.5	955	4.3
Arizona	4,323	100.0	3,097	71.6	2,352	54.4	234	5.4	474	10.9	37	.9	963	22.3	263	6.1
[illegible]lo	5,876	100.0	4,448	75.7	3,262	55.5	486	8.3	660	11.2	40	.7	1,298	22.1	130	2.2
Idaho	2,812	100.0	1,982	70.5	1,470	52.3	246	8.7	264	9.4	2	.1	808	28.7	22	.8
Montana	1,907	100.0	1,412	74.0	1,097	57.5	184	9.6	126	6.6	5	.3	474	24.9	21	1.1
Nevada	1,397	100.0	976	69.9	807	57.8	90	6.4	72	5.2	7	.5	372	26.6	49	3.5
New Mexico	2,519	100.0	1,736	68.9	1,365	54.2	21	.8	347	13.8	3	.1	691	27.4	92	3.7
Utah	2,683	100.0	1,636	61.0	1,128	42.1	261	9.7	230	8.6	17	.6	676	25.2	371	13.8
Wyoming	648	100.0	486	75.0	365	56.3	59	9.1	61	9.4	1	.2	155	23.9	7	1.1
Pacific	64,521	100.0	37,058	57.5	28,355	44.0	3,941	6.1	4,494	7.0	268	.4	13,240	20.5	14,223	22.0
Alaska	624	100.0	391	62.7	301	48.3	25	4.0	63	10.1	2	.3	213	34.1	20	3.2
California	47,725	100.0	25,976	54.4	20,052	42.0	2,966	6.2	2,782	5.8	176	.4	8,335	17.6	13,414	28.1
Hawaii	2,189	100.0	1,365	62.3	1,228	56.1	60	2.7	63	2.9	14	.6	382	17.5	442	20.2
Oregon	4,174	100.0	3,041	72.9	2,209	52.9	42	1.0	770	18.5	20	.5	1,033	24.7	100	2.4
Washington	9,809	100.0	6,285	64.1	4,565	46.5	848	8.7	816	8.3	56	.6	3,277	33.4	247	2.5

Source: American Nurses' Association. Inventory of Licensed Practical Nurses, 1974. Unpublished data.

Table II-10.--Field of employment of employed registered nurses in each State and region, 1972

State and region	Total number	Hospital		Nursing home		School of nursing		Private duty		Public health		School nurse		Industrial		Office nurse (physician's or dentist's)		Other specified field		Not reported	
		Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
United States, number	778,470	499,594	...	53,988	...	28,820	...	38,923	...	39,096	...	29,849	...	19,403	...	52,390	...	4,086	...	12,321	...
percent	100.0	...	64.2	...	7.0	...	3.7	...	5.0	...	5.0	...	3.8	...	2.5	...	6.7	...	0.5	...	1.6
New England	69,869	42,111	60.3	7,941	11.4	2,580	3.7	5,056	7.2	3,400	4.9	2,989	4.3	1,386	2.0	2,945	4.2	450	0.6	1,011	1.4
Connecticut	17,567	9,031	51.4	2,677	15.3	491	2.8	1,910	10.9	769	4.4	932	5.3	463	2.6	901	5.1	247	1.4	146	0.8
Maine	4,700	3,023	64.3	354	7.5	145	3.1	325	6.9	266	5.7	150	3.2	106	2.3	257	5.5	21	0.4	53	1.1
Massachusetts	35,755	22,718	63.5	3,704	10.4	1,512	4.2	2,192	6.1	1,737	4.9	1,311	3.7	620	1.7	1,220	3.4	111	0.3	630	1.8
New Hampshire	4,388	2,510	57.2	531	12.1	169	3.9	251	5.7	221	5.1	251	5.7	70	1.6	278	6.3	41	0.9	66	1.5
Rhode Island	4,631	3,206	69.2	322	6.9	163	3.5	245	5.3	217	4.7	175	3.8	87	1.9	124	2.7	19	0.4	73	1.6
Vermont	2,828	1,623	57.4	353	12.5	100	3.6	133	4.7	190	6.7	170	6.0	40	1.4	165	5.8	11	0.4	43	1.5
Middle Atlantic	178,910	109,174	61.0	12,612	7.0	6,942	3.9	13,902	7.8	8,399	4.7	10,162	5.7	4,689	2.6	9,412	5.3	581	0.3	3,037	1.7
New Jersey	30,973	16,838	54.4	2,470	8.0	974	3.1	2,068	6.7	1,468	4.7	2,527	8.2	903	2.9	2,108	6.8	91	0.3	1,526	4.9
New York	89,072	56,054	62.9	5,674	6.4	3,620	4.1	7,564	8.5	4,666	5.2	4,562	5.1	2,132	2.4	3,624	4.1	289	0.3	887	1.0
Pennsylvania	58,865	36,282	61.6	4,468	7.6	2,348	4.0	4,270	7.3	2,265	3.8	3,073	5.2	1,654	2.8	3,680	6.3	201	0.3	624	1.1
South Atlantic	107,116	68,103	63.6	5,303	4.9	3,887	3.6	7,186	6.7	7,312	6.8	2,638	2.5	2,736	2.6	7,601	7.1	675	0.6	1,675	1.6
Delaware	2,886	1,567	54.3	217	7.5	149	5.2	172	6.0	152	5.3	220	7.6	105	3.6	257	8.9	13	0.4	34	1.2
Dist. of Columbia	4,968	3,197	64.3	79	1.6	207	4.2	441	8.9	388	7.8	95	1.9	238	4.8	167	3.4	44	0.9	112	2.2
Florida	25,498	16,358	64.1	1,696	6.6	587	2.3	2,283	8.9	1,417	5.6	199	0.8	477	1.9	1,937	7.6	91	0.4	453	1.8
Georgia	12,353	7,814	63.2	589	4.8	484	3.9	738	6.0	974	7.9	191	1.5	338	2.7	811	6.6	256	2.1	158	1.3
Maryland	14,596	9,149	62.7	857	5.9	622	4.3	766	5.2	1,256	8.6	498	3.4	344	2.3	831	5.7	59	0.4	214	1.5
North Carolina	16,573	10,540	63.6	580	3.5	695	4.2	958	5.8	1,051	6.3	581	3.5	397	2.4	1,358	8.2	98	0.6	315	1.9
South Carolina	7,790	4,621	59.3	423	5.4	269	3.4	516	6.6	573	7.4	249	3.2	263	3.4	722	9.3	39	0.5	115	1.5
Virginia	16,472	10,606	64.4	692	4.2	638	3.9	1,030	6.3	1,192	7.2	482	2.9	381	2.3	1,195	7.3	57	0.3	199	1.2
West Virginia	5,980	4,251	71.1	170	2.8	236	3.9	282	4.7	309	5.2	123	2.1	193	3.2	323	5.4	18	0.3	75	1.3
East South Central	30,624	20,996	68.5	1,237	4.0	1,367	4.5	1,154	3.8	2,078	6.8	559	1.8	907	3.0	1,578	5.1	299	1.0	449	1.5
Alabama	7,753	5,397	69.6	312	4.0	352	4.5	223	2.9	450	5.8	132	1.7	239	3.1	400	5.2	58	0.7	190	2.5
Kentucky	8,432	5,916	70.2	449	5.3	380	4.5	224	2.6	615	7.3	129	1.5	227	2.7	397	4.7	31	0.4	64	0.8
Mississippi	5,101	3,330	65.3	197	3.9	231	4.5	230	4.5	360	7.0	156	3.1	68	1.3	342	6.7	151	3.0	36	0.7
Tennessee	9,338	6,353	68.1	279	3.0	404	4.3	477	5.1	653	7.0	142	1.5	373	4.0	439	4.7	59	0.6	159	1.7
West South Central	47,233	31,545	66.8	2,304	4.9	1,872	4.0	1,923	4.1	2,516	5.3	2,235	4.7	1,009	2.1	3,086	6.5	170	0.4	573	1.2
Arkansas	3,757	2,532	67.4	248	6.6	168	4.5	93	2.5	269	7.1	106	2.8	61	1.6	202	5.4	10	0.3	68	1.8
Louisiana	9,070	6,103	67.3	439	4.8	376	4.2	493	5.4	627	6.9	162	1.8	209	2.3	535	5.9	32	0.4	94	1.0
Oklahoma	6,496	4,458	68.6	498	7.7	223	3.4	187	2.9	344	5.3	214	3.3	96	1.5	424	6.5	31	0.5	21	0.3
Texas	27,910	18,452	66.1	1,119	4.0	1,105	4.0	1,150	4.1	1,276	4.6	1,753	6.3	643	2.3	1,925	6.9	97	0.3	390	1.4

Table II-10.--Field of employment of employed registered nurses in each State and region, 1972--continued

State and region	Total number	Hospital		Nursing home		School of nursing		Private duty		Public health		School nurse		Industrial		Office nurse [physician's or dentist's]		Other specified field		Not reported	
		Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
East North Central	148,842	97,739	65.7	10,613	7.1	5,333	3.6	4,275	2.9	6,204	4.2	3,843	2.6	5,429	3.6	11,371	7.6	969	0.6	3,066	2.1
Illinois	44,223	29,499	66.7	2,739	6.2	1,522	3.5	1,522	3.4	1,738	3.9	1,508	3.4	1,570	3.6	3,510	7.9	128	0.3	487	1.1
Indiana	15,539	8,214	52.9	1,108	7.1	497	3.2	515	3.3	555	3.6	617	4.0	660	4.2	1,574	10.1	60	0.4	1,739	11.2
Michigan	29,923	20,605	68.9	1,839	6.1	1,075	3.6	700	2.3	1,393	4.7	462	1.5	1,179	3.9	2,173	7.3	119	0.4	378	1.3
Ohio	40,308	27,035	67.1	2,466	6.1	1,460	3.6	1,275	3.2	1,530	3.8	982	2.4	1,522	3.8	3,100	7.7	620	1.5	318	0.8
Wisconsin	18,849	12,386	65.7	2,461	13.1	779	4.1	263	1.4	988	5.2	274	1.5	498	2.6	1,014	5.4	42	0.2	144	0.8
West North Central	66,356	44,746	67.4	5,548	8.4	2,989	4.5	1,535	2.3	2,457	3.7	2,633	4.0	1,010	1.5	4,413	6.7	334	0.5	691	1.0
Iowa	11,925	7,708	64.6	1,088	9.1	502	4.2	306	2.6	330	2.8	567	4.8	179	1.5	1,014	8.5	171	1.4	60	0.5
Kansas	8,961	6,080	67.8	539	6.0	363	4.1	177	2.0	396	4.4	391	4.4	95	1.1	855	9.5	8	0.1	57	0.6
Minnesota	18,222	12,618	69.2	1,973	10.8	667	3.7	452	2.5	633	3.5	625	3.4	254	1.4	733	4.0	55	0.3	212	1.2
Missouri	14,721	9,926	67.4	751	5.1	781	5.3	359	2.4	669	4.6	702	4.8	385	2.6	898	6.1	40	0.3	210	1.4
Nebraska	6,649	4,637	69.7	463	7.0	381	5.7	125	1.9	182	2.7	230	3.5	80	1.2	440	6.6	39	0.6	72	1.1
North Dakota	2,853	1,936	67.9	316	11.1	150	5.3	66	2.3	109	3.8	29	1.0	10	0.3	188	6.6	8	0.3	41	1.4
South Dakota	3,025	1,841	60.9	418	13.8	145	4.8	50	1.7	138	4.6	89	2.9	7	0.2	285	9.4	13	0.4	39	1.3
Mountain	33,950	22,822	67.2	2,130	6.3	1,112	3.3	854	2.5	1,793	5.3	1,404	4.1	437	1.3	2,826	8.3	234	0.7	338	1.0
Arizona	7,418	4,897	66.0	319	4.3	259	3.5	255	3.4	395	5.3	484	6.5	100	1.4	564	7.6	112	1.5	33	0.5
Colorado	11,634	7,809	67.1	1,042	9.0	335	2.9	275	2.4	603	5.2	377	3.2	177	1.5	831	7.1	60	0.5	125	1.1
Idaho	2,504	1,701	67.9	188	7.5	77	3.1	40	1.6	124	4.9	60	2.4	29	1.2	265	10.6	10	0.4	10	0.4
[illegible]	3,246	2,110	65.0	267	8.2	99	3.1	112	3.5	173	5.3	64	2.0	14	0.4	367	11.3	4	0.1	36	1.1
Nevada	1,718	1,154	67.2	50	2.9	49	2.8	57	3.3	101	5.9	62	3.6	22	1.3	192	11.2	16	0.9	15	0.9
New Mexico	2,755	1,810	65.7	66	2.4	95	3.5	69	2.5	183	6.6	194	7.0	37	1.4	248	9.0	22	0.8	31	1.1
Utah	3,205	2,339	73.0	105	3.3	158	4.9	33	1.0	157	4.9	65	2.0	44	1.4	214	6.7	5	0.2	85	2.6
Wyoming	1,470	1,002	68.2	93	6.3	40	2.7	13	0.9	57	3.9	98	6.7	14	0.9	145	9.9	5	0.3	3	0.2
Pacific	95,570	62,358	65.2	6,300	6.6	2,738	2.9	3,038	3.2	4,937	5.2	[illegible],386	3.5	1,800	1.9	9,158	9.6	374	0.4	1,481	1.5
Alaska	1,373	818	59.6	66	4.8	18	1.3	9	0.6	141	10.3	78	5.7	9	0.7	193	14.1	6	0.4	35	2.5
California	68,118	45,143	66.3	3,774	5.5	1,921	2.8	2,503	3.7	3,445	5.1	2,708	4.0	1,449	2.1	5,862	8.6	304	0.4	1,009	1.5
Hawaii	3,074	2,060	67.0	144	4.7	59	1.9	96	3.1	189	6.1	49	1.6	39	1.3	372	12.1	12	0.4	54	1.8
Oregon	8,739	5,662	64.8	692	7.9	247	2.8	193	2.2	510	5.9	134	1.5	116	1.3	1,042	11.9	23	0.3	120	1.4
Washington	14,266	8,675	60.8	1,624	11.4	493	3.5	237	1.7	652	4.6	417	2.9	187	1.3	1,689	11.8	29	0.2	263	1.8

Source: Roth, Aleda V., and Walden, Alice R. The Nation's Nurses: 1972 Inventory of Registered Nurses. Kansas City, American Nurses' Association, 1974, p. 41.

Table II-11.--Employed registered nurses by type of position in each State and region, 1972

State and region	Total		Administrator or assistant		Consultant		Supervisor or assistant		Instructor		Head Nurse or assistant		Staff or general duty nurse		Other[1/]		Not reported	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
United States	778,470	100.0	29,752	3.8	6,681	.9	80,648	10.4	32,657	4.2	119,905	15.4	432,976	55.6	58,841	7.0	21,010	2.7
New England	69,869	100.0	2,709	3.9	487	.7	6,504	9.3	2,929	4.2	11,223	16.0	37,500	53.7	6,316	9.0	2,201	3.2
Connecticut	17,567	100.0	593	3.4	93	.5	1,197	6.8	654	3.7	2,406	13.7	9,506	54.1	2,461	14.0	657	3.7
Maine	4,700	100.0	196	4.2	21	.5	557	11.8	158	3.4	871	18.5	2,375	50.5	401	8.5	121	2.6
Massachusetts	35,755	100.0	1,416	4.0	285	.8	3,537	9.9	1,655	4.6	6,049	16.9	19,013	53.2	2,662	7.4	1,138	3.2
New Hampshire	4,388	100.0	207	4.7	29	.7	515	11.8	163	3.7	761	17.3	2,296	52.3	314	7.2	103	2.3
Rhode Island	4,631	100.0	162	3.5	26	.5	433	9.4	201	4.3	730	15.8	2,681	57.9	308	6.7	90	1.9
Vermont	2,828	100.0	135	4.8	33	1.2	265	9.4	98	3.4	406	14.3	1,629	57.6	170	6.0	92	3.3
Middle Atlantic	178,910	100.0	5,771	3.2	1,361	.8	16,646	9.3	7,144	4.0	28,202	15.8	96,324	53.8	16,802	9.4	6,660	3.7
New Jersey	30,973	100.0	1,067	3.4	220	.7	2,571	8.2	1,000	3.2	4,222	13.6	17,138	55.4	2,477	8.0	2,328	7.5
New York	89,072	100.0	2,831	3.2	683	.8	8,641	9.7	3,763	4.2	16,137	18.1	44,990	50.5	8,721	9.8	3,306	3.7
Pennsylvania	58,865	100.0	1,873	3.2	458	.8	5,484	9.3	2,381	4.1	7,843	13.3	34,196	58.1	5,604	9.5	1,026	1.7
South Atlantic	107,116	100.0	4,212	3.9	971	.9	10,981	10.3	4,695	4.4	15,650	14.6	57,920	54.1	10,188	9.5	2,499	2.3
Delaware	2,886	100.0	105	3.6	25	.8	239	8.3	176	6.1	370	12.8	1,704	59.1	277	7.9	40	1.4
Dist. of Columbia	4,968	100.0	237	4.8	120	2.4	501	10.1	291	5.8	718	14.5	2,425	48.8	527	10.6	149	3.0
Florida	25,498	100.0	872	3.4	171	.7	2,620	10.3	915	3.6	4,485	17.6	12.880	50.5	2,752	10.8	803	3.1
Georgia	12,353	100.0	675	5.5	109	.9	1,485	12.0	588	4.8	2,036	16.5	5,847	47.3	1,397	11.3	216	1.7
Maryland	14,596	100.0	641	4.4	207	1.4	1,568	10.7	655	4.5	1,891	13.0	8,329	57.1	1,042	7.1	263	1.8
North Carolina	16,573	100.0	728	4.3	140	.9	1,520	9.2	799	4.8	2,036	12.3	9,296	56.1	1,702	10.3	352	2.1
South Carolina	7,790	100.0	274	3.5	74	.9	830	10.6	310	4.0	1,002	12.9	4,391	56.4	693	8.9	216	2.8
Virginia	16,472	100.0	513	3.1	100	.6	1,534	9.3	702	4.3	2,390	14.5	9,506	57.7	1,403	8.5	324	2.0
West Virginia	5,980	100.0	167	2.8	25	.4	684	11.5	259	4.3	722	12.1	3,542	59.2	445	7.4	136	2.3
East South Central	30,624	100.0	1,215	4.0	245	.8	4,111	13.4	1,555	5.1	4,649	15.1	15,634	51.1	2,502	8.2	713	2.3
Alabama	7,753	100.0	336	4.3	55	.7	1,117	14.4	396	5.1	1,184	15.3	3,996	51.6	504	6.5	165	2.1
Kentucky	8,432	100.0	348	4.1	83	1.0	1,095	13.0	416	4.9	1,256	14.9	4,627	54.9	371	4.4	236	2.8
Mississippi	5,101	100.0	172	3.4	38	.7	668	13.1	243	4.8	662	13.0	2,434	47.7	842	16.5	42	.8
Tennessee	9,338	100.0	359	3.8	69	.7	1,231	13.2	500	5.4	1,547	16.6	4,577	49.0	785	8.4	270	2.9
West South Central	47,233	100.0	2,393	5.0	397	.9	7,633	16.2	2,147	4.5	8,607	18.2	21,804	46.2	3,136	6.6	1,116	2.4
Arkansas	3,757	100.0	244	6.5	36	1.0	689	18.3	182	4.8	763	20.3	1,482	39.5	199	5.3	162	4.3
Louisiana	9,070	100.0	358	4.0	57	.6	1,368	15.1	415	4.6	1,535	16.9	4,374	48.2	797	8.8	166	1.8
Oklahoma	6,496	100.0	341	5.3	41	.6	1,178	18.2	276	4.2	1,027	15.8	3,241	49.9	331	5.1	61	.9
Texas	27,910	100.0	1,450	5.2	263	1.0	4,398	15.7	1,274	4.6	5,282	18.9	12,707	45.5	1,809	6.5	727	2.6

Table II-11.--Employed registered nurses by type of position in each State and region, 1972--continued

State and region	Total		Administrator or assistant		Consultant		Supervisor or assistant		Instructor		Head Nurse or assistant		Staff or general duty nurse		Other[1/]		Not reported	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
East North Central	148,842	100.0	5,600	3.8	1,280	.9	14,694	9.8	6,501	4.4	21,540	14.5	89,217	59.9	6,981	4.7	3,029	2.0
Illinois	44,223	100.0	1,756	4.0	502	1.1	4,440	10.0	1,711	3.9	6,392	14.5	25,951	58.6	2,107	4.8	1,364	3.1
Indiana	15,539	100.0	625	4.0	87	.6	1,624	10.5	656	4.2	2,389	15.4	9,095	58.5	770	5.0	293	1.8
Michigan	29,923	100.0	1,191	4.0	242	.8	3,105	10.4	1,437	4.8	4,762	15.9	17,497	58.5	1,232	4.1	457	1.5
Ohio	40,308	100.0	1,231	3.1	297	.7	3,650	9.1	1,778	4.4	5,713	14.2	24,727	61.3	2,251	5.6	661	1.6
Wisconsin	18,849	100.0	797	4.2	152	.8	1,875	10.0	919	4.9	2,284	12.1	11,947	63.4	621	3.3	254	1.3
West North Central	66,356	100.0	2,588	3.9	655	1.0	7,091	10.7	3,242	4.8	8,606	13.0	39,720	59.9	3,011	4.5	1,443	2.2
Iowa	11,925	100.0	483	4.1	85	.7	1,273	10.7	564	4.7	1,311	11.0	7,518	63.0	615	5.2	76	.6
Kansas	8,961	100.0	365	4.1	88	1.0	1,111	12.4	378	4.2	1,460	16.3	5,047	56.3	316	3.5	196	2.2
Minnesota	18,222	100.0	556	3.1	125	.7	1,682	9.2	797	4.4	2,317	12.7	11,416	62.6	869	4.8	460	2.5
Missouri	14,721	100.0	683	4.6	249	1.7	1,683	11.4	781	5.3	1,891	12.8	8,353	56.8	677	4.6	404	2.8
Nebraska	6,649	100.0	247	3.7	70	1.1	711	10.7	398	6.0	799	12.0	4,033	60.6	277	4.2	114	1.7
North Dakota	2,853	100.0	105	3.7	14	.5	321	11.3	165	5.8	402	14.1	1,591	55.8	132	4.6	123	4.2
South Dakota	3,025	100.0	149	4.9	24	.8	310	10.2	159	5.3	426	14.1	1,762	58.3	125	4.1	70	2.3
Mountain	33,950	100.0	1,257	3.7	348	1.0	3,132	9.2	1,201	3.5	4,264	12.6	21,214	62.5	1,633	4.8	901	2.7
Arizona	7,418	100.0	266	3.6	51	.7	590	8.0	279	3.8	1,071	14.4	4,572	61.6	523	7.0	66	.9
Colorado	11,634	100.0	386	3.3	161	1.4	997	8.6	369	3.2	1,363	11.7	7,754	66.6	443	3.8	161	1.4
Idaho	2,504	100.0	88	3.5	10	.4	291	11.6	88	3.5	413	16.5	1,443	57.6	152	6.1	19	.8
Montana	3,246	100.0	134	4.1	29	.9	307	9.5	102	3.1	417	12.8	2,017	62.2	174	5.4	66	2.0
Nevada	1,718	100.0	62	3.6	11	.6	185	10.8	57	3.3	257	15.0	1,013	59.0	89	5.2	44	2.5
New Mexico	2,755	100.0	135	4.9	31	.8	361	13.1	97	3.5	234	8.5	1,443	52.4	138	5.0	326	11.8
Utah	3,205	100.0	116	3.6	52	1.6	262	8.2	166	5.2	365	11.4	1,973	61.5	76	2.4	195	6.1
Wyoming	1,470	100.0	70	4.8	13	.9	139	9.5	43	2.9	144	9.8	999	67.9	38	2.6	24	1.6
Pacific	95,570	100.0	4,007	4.2	937	1.0	9,856	10.3	3,243	3.4	17,164	17.9	53,643	56.1	4,272	4.5	2,448	2.6
Alaska	1,373	100.0	64	4.7	20	1.5	127	9.2	24	1.7	164	11.9	881	64.2	31	2.3	62	4.5
California	68,118	100.0	2,908	4.3	678	1.0	7,220	10.6	2,337	3.4	12,667	18.6	37,330	54.8	3,307	4.8	1,671	2.5
Hawaii	3,074	100.0	112	3.6	35	1.1	268	8.7	77	2.5	377	12.4	1,951	63.5	164	5.3	90	2.9
Oregon	8,739	100.0	411	4.7	66	.8	898	10.3	287	3.3	1,566	17.9	4,972	56.9	343	3.9	196	2.2
Washington	14,266	100.0	512	3.6	138	1.0	1,343	9.4	518	3.6	2,390	16.8	8,509	59.6	427	3.0	429	3.0

1/ Includes private duty nurses.

Source: American Nurses' Association, Statistics Department. Report of 1972 Inventory of Registered Nurses. Kansas City, 1974. Unpublished data.

Table II-12.--Field of employment of employed licensed practical nurses in each State and region, 1974

State and region	Total	Field of employment																	
		Hospital		Nursing home		Private duty		Public health		Industry		Physician's or Dentist's office		Other		Not reported	
	Number	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
United States	377,889	238,467		65,351		28,210		5,863		2,320		24,497		10,708		2,473	
Number			63.1		17.3		7.5		1.5		0.6		6.5		2.8		0.7
Percent																	
New England	25,284	15,235	60.3	6,283	24.8	1,594	6.3	377	1.5	110	0.4	953	3.8	618	2.4	114	0.5
Connecticut	5,610	3,184	56.7	1,520	27.1	374	6.7	112	2.0	26	0.5	345	6.1	29	0.5	20	0.4
Maine	1,865	1,227	65.8	359	19.3	122	6.5	12	0.6	8	0.4	85	4.6	50	2.7	2	0.1
Massachusetts	12,799	7,577	59.2	3,381	26.4	772	6.0	189	1.5	56	0.4	340	2.7	418	3.3	66	0.5
New Hampshire	1,500	916	61.1	356	23.7	104	6.9	15	1.0	3	0.2	76	5.1	24	1.6	6	0.4
Rhode Island	2,239	1,590	71.0	332	14.8	149	6.7	37	1.6	13	0.6	56	2.5	55	2.5	7	0.3
Vermont	1,271	741	58.3	335	26.4	73	5.7	12	1.0	4	0.3	51	4.0	42	3.3	13	1.0
Middle Atlantic	66,139	39,725	60.1	11,986	18.1	8,354	12.6	1,023	1.6	286	0.4	2,533	3.8	2,035	3.1	197	0.3
New Jersey	9,104	5,921	65.0	1,174	12.9	958	10.5	110	1.2	45	0.5	476	5.2	380	4.0	40	0.5
New York	32,817	19,464	59.3	6,481	19.7	4,142	12.6	579	1.8	133	0.4	1,057	3.2	905	2.8	56	0.2
Pennsylvania	24,218	14,340	59.2	4,331	17.9	3,254	13.4	334	1.4	108	0.5	1,000	4.1	750	3.1	101	0.4
South Atlantic	54,059	35,328	65.4	6,612	12.2	4,993	9.2	897	1.7	364	0.7	4,339	8.0	1,097	2.0	429	0.8
Delaware	823	532	64.6	85	10.3	102	12.4	20	2.4	5	0.6	50	6.1	22	2.7	7	0.9
District of Col.	2,297	1,624	70.7	128	5.6	296	12.9	95	4.1	13	0.6	57	2.5	72	3.1	12	0.5
Florida	12,313	7,101	57.7	1,862	15.1	1,546	12.6	140	1.1	33	0.3	1,176	9.5	165	1.3	290	2.4
Georgia	7,822	4,836	61.8	1,348	17.2	459	5.9	182	2.3	92	1.2	662	8.5	223	2.8	20	0.3
Maryland	5,098	3,410	66.9	727	14.2	468	9.2	86	1.7	32	0.6	243	4.8	116	2.3	16	0.3
North Carolina	8,851	6,244	70.6	816	9.2	665	7.5	76	.9	88	1.0	799	9.0	154	1.7	9	0.1
South Carolina	4,496	2,999	66.7	525	11.7	335	7.4	126	2.8	44	1.0	354	7.9	93	2.1	20	0.4
Virginia	8,928	6,035	67.6	905	10.1	832	9.3	124	1.4	44	0.5	777	8.7	195	2.2	16	0.2
West Virginia	3,431	2,547	74.2	216	6.3	290	8.5	48	1.4	13	0.4	221	6.4	57	1.7	39	0.1
East South Central	27,617	18,699	67.7	3,314	12.0	1,816	6.6	345	1.2	334	1.2	2,239	8.1	595	2.2	275	1.0
Alabama	8,217	5,512	67.1	1,264	15.4	484	5.9	43	.5	76	0.9	643	7.8	95	1.2	99	1.2
Kentucky	5,146	3,468	67.4	584	11.3	359	7.0	81	1.6	67	1.3	420	8.2	146	2.8	21	0.4
Mississippi	4,702	3,158	67.1	562	11.9	309	6.6	65	1.4	38	0.8	366	7.8	201	4.3	3	0.1
Tennessee	9,552	6,561	68.7	904	9.5	664	6.9	154	1.6	153	1.6	810	8.5	153	1.6	153	1.6
West South Central	49,434	30,220	61.1	9,018	18.2	2,946	6.0	937	1.9	279	0.6	4,508	9.1	1,208	2.5	318	0.6
Arkansas	4,959	3,223	65.0	621	12.5	318	6.4	71	1.5	69	1.4	542	10.9	104	2.1	11	0.2
Louisiana	7,460	4,460	59.8	1,240	16.6	786	10.5	171	2.3	47	0.6	596	8.0	148	2.0	12	0.2
Oklahoma	5,462	3,484	63.8	1,178	21.6	212	3.9	92	1.7	30	0.5	354	6.5	110	2.0	2	(1)
Texas	31,553	19,053	60.4	5,979	18.9	1,630	5.0	603	1.9	133	0.4	3,016	9.6	846	2.7	295	0.9

166

Table II-12.--Field of employment of employed licensed practical nurses in each State and region, 1974--continued

State and region	Total Number	Field of employment: Hospital Number	Hospital Percent	Nursing home Number	Nursing home Percent	Private duty Number	Private duty Percent	Public health Number	Public health Percent	Industry Number	Industry Percent	Physician's or Dentist's office Number	Physician's or Dentist's office Percent	Other Number	Other Percent	Not reported Number	Not reported Percent
East North Central	70,371	45,230	64.3	13,298	18.9	4,196	6.0	945	1.3	525	0.8	3,302	4.7	2,282	3.2	593	0.8
Illinois	15,173	9,058	59.7	2,841	18.7	1,480	9.7	312	2.1	182	1.2	846	5.6	381	2.5	73	0.5
Indiana	6,200	3,795	61.2	1,248	20.1	366	5.9	84	1.4	73	1.2	496	8.0	120	1.9	18	0.3
Michigan	17,479	12,452	71.2	2,543	14.5	511	2.9	254	1.5	124	0.7	1,382	7.9	98	0.6	115	0.7
Ohio	23,585	15,104	64.0	4,572	19.4	1,694	7.2	240	1.0	55	0.2	180	0.8	1,361	5.8	379	1.6
Wisconsin	7,934	4,821	60.8	2,094	26.4	145	1.8	55	0.7	91	1.1	398	5.0	322	4.1	8	0.1
West North Central	32,154	20,422	63.5	6,416	19.9	1,376	4.3	444	1.4	162	0.5	2,368	7.4	664	2.1	302	0.9
Iowa	5,571	3,314	59.5	1,416	25.4	135	2.4	42	0.8	25	0.4	424	7.6	189	3.4	26	0.5
Kansas	3,140	2,120	67.5	522	16.6	141	4.5	46	1.5	9	0.3	206	6.6	66	2.1	30	0.9
Minnesota	9,092	5,722	63.0	2,067	22.7	228	2.5	89	1.0	20	0.2	783	8.6	155	1.7	28	0.3
Missouri	8,973	5,753	64.1	1,294	14.4	755	8.4	186	2.1	92	1.0	538	6.0	169	1.9	186	2.1
Nebraska	2,805	1,789	63.8	606	21.6	81	2.9	32	1.1	14	0.5	211	7.5	52	1.9	20	0.7
North Dakota	1,392	969	69.6	258	18.5	19	1.4	14	1.0	1	0.1	103	7.4	19	1.4	9	0.6
South Dakota	1,181	755	63.9	253	21.4	17	1.4	35	3.0	1	0.1	103	8.7	14	1.2	3	0.3
Mountain	15,773	10,045	63.7	2,493	15.8	991	6.8	361	2.3	49	0.3	1,282	8.1	478	3.0	74	0.5
Arizona	3,097	1,928	62.3	264	8.5	340	11.0	148	1.8	10	0.3	222	4.2	153	4.9	32	1.0
Colorado	4,448	2,437	54.8	1,090	24.5	328	7.4	56	1.3	13	0.3	367	8.2	137	3.1	20	.4
Idaho	1,982	1,394	70.3	285	14.4	47	2.4	31	1.5	7	0.4	177	8.9	34	1.7	7	0.4
[illegible]	1,412	956	67.7	289	20.5	46	3.3	23	1.6	2	0.1	72	5.1	19	1.3	5	0.4
Nevada	976	710	72.7	87	8.9	60	6.2	11	1.1	1	0.1	85	8.7	19	2.0	3	0.3
New Mexico	1,736	1,159	66.8	145	8.3	104	6.0	74	4.3	3	0.2	178	10.2	70	4.0	3	0.2
Utah	1,636	1,149	70.2	225	13.8	49	3.0	15	0.9	7	0.4	151	9.2	36	2.2	4	0.3
Wyoming	486	312	64.2	108	22.2	17	3.5	3	0.6	6	1.2	30	6.2	10	2.1	0	0.0
Pacific	37,058	23,563	63.6	5,931	16.0	1,944	5.2	534	1.4	211	0.6	2,973	8.0	1,731	4.7	171	0.5
Alaska	391	272	69.6	36	9.2	8	2.0	23	5.9	3	0.8	20	5.1	26	6.6	3	0.8
California	25,976	16,448	63.3	4,039	15.6	1,525	5.9	320	1.2	153	0.6	2,058	7.9	1,326	5.1	107	0.4
Hawaii	1,365	863	63.2	73	5.4	51	3.7	43	3.2	7	0.5	206	15.1	112	8.2	10	0.7
Oregon	3,041	1,997	65.7	498	16.4	89	2.9	71	2.3	20	0.7	293	9.6	63	2.1	10	0.3
Washington	6,285	3,983	63.4	1,285	20.4	271	4.3	77	1.2	28	0.4	396	6.3	204	3.3	41	0.7

1/ Less than .1 percent.

Source: American Nurses' Association. Inventory of Licensed Practical Nurses, 1974. Unpublished data.

Table II-13.--Bedside nursing personnel[1/] per 100 average daily patients in all AHA hospitals, by type of hospital, by census region, 1972

Census region and type of hospital	Number of hospitals	Average daily patient census	Nursing personnel per 100 patients			
			Total	Registered Nurses	Licensed practical nurses	Aides, orderlies, attendants
United States	7,035	1,172,014	74.8	21.5	16.4	36.9
Federal	400	114,757	54.9	17.9	7.9	29.1
Non-Federal	6,635	1,057,347	77.0	21.9	17.3	37.8
Short-term general and allied special	5,832	671,280	99.6	33.5	24.6	41.6
Psychiatric	500	329,046	36.4	1.6	4.1	30.7
Tuberculosis	75	8,214	47.4	4.7	12.8	29.9
Other long term	228	48,807	49.9	5.2	8.6	36.1
Northeast	1,274	347,467	67.4	22.0	13.0	32.4
Federal	56	24,796	48.0	15.1	5.0	27.9
Non-Federal	1,218	322,671	68.9	22.6	13.6	32.7
Short-term general and allied special	967	174,845	94.7	39.7	21.6	33.4
Psychiatric	148	123,249	36.0	1.6	2.8	31.6
Tuberculosis	9	823	54.8	7.3	17.4	30.1
Other long term	94	23,754	52.4	6.2	10.7	35.5
North Central	1,991	319,454	77.8	22.6	15.3	40.0
Federal	79	25,859	50.6	15.4	6.1	29.2
Non-Federal	1,912	293,595	80.2	23.2	16.1	40.9
Short-term general and allied special	1,697	206,963	96.8	32.1	21.4	43.3
Psychiatric	141	72,604	39.8	1.7	2.6	35.5
Tuberculosis	24	1,875	46.2	6.4	10.1	29.7
Other long term	50	12,153	44.9	2.9	6.5	35.5
South	2,426	360,901	74.6	16.0	18.7	39.8
Federal	152	44,886	55.5	18.0	8.8	28.7
Non-Federal	2,274	316,015	77.3	15.7	20.1	41.4
Short-term general and allied special	2,049	200,102	101.9	24.2	30.0	47.7
Psychiatric	138	104,431	33.1	.8	2.5	29.8
Tuberculosis	36	4,774	47.1	2.8	12.6	31.7
Other long term	51	6,708	52.6	3.8	7.9	40.9
West	1,344	144,282	89.3	31.9	22.0	35.4
Federal	113	19,216	68.4	24.7	11.9	31.8
Non-Federal	1,231	125,066	92.5	33.0	23.6	36.0
Short-term general and allied special	1,119	89,370	111.9	44.0	26.0	41.8
Psychiatric	73	28,762	43.0	4.2	20.1	18.6
Tuberculosis	6	742	45.0	10.0	15.2	19.8
Other long term	33	6,192	49.5	9.2	5.3	35.0

1/ Includes bedside general duty staff working full time plus one-half of those working part time as of the study week.

Source: U.S. Department of Health, Education, and Welfare, Division of Nursing, Nursing Personnel in Hospitals: 1972 Survey of Hospitals Registered with the American Hospital Association. DHEW Pub. No (HRA) 75-16. Washington, U.S. Government Printing Office, 1974.

Table II-14.--Bedside nursing personnel per 100 average daily patients in AHA non-Federal short-term general and allied special hospitals, by State, 1972

State	Number of hospitals	Full-time equivalent Nursing personnel per 100 patients			
		Total	Registered nurses	Licensed practical nurses	Aides, orderlies, attendants
United States	5,832	99.6	33.5	24.6	41.6
Alabama	128	102.1	20.7	35.4	45.9
Alaska	14	127.4	56.1	28.4	42.9
Arizona	60	117.2	43.2	24.7	49.3
Arkansas	89	104.9	11.3	40.2	53.4
California	536	111.5	44.4	24.2	42.9
Colorado	78	108.6	47.3	21.3	40.0
Connecticut	41	100.8	41.5	22.9	36.4
Delaware	7	106.4	39.8	26.2	40.3
District of Columbia	14	103.7	42.5	25.3	35.9
Florida	170	102.9	33.2	24.8	44.9
Georgia	146	110.6	24.5	29.0	57.1
Hawaii	22	94.6	43.1	31.1	20.4
Idaho	48	111.5	36.0	48.6	26.9
Illinois	250	95.1	36.7	17.5	40.9
Indiana	112	96.7	28.4	17.5	50.8
Iowa	136	95.3	32.9	19.2	43.2
Kansas	142	100.1	25.8	16.1	58.1
Kentucky	109	99.9	23.4	24.9	51.6
Louisiana	133	106.6	19.7	27.7	59.2
Maine	45	97.8	35.2	25.5	37.0
Maryland	47	106.3	38.8	19.3	48.1
Massachusetts	138	104.1	50.5	23.7	30.0
Michigan	202	95.7	29.7	26.0	40.0
Minnesota	176	103.4	40.2	25.2	38.1
Mississippi	100	103.4	15.3	33.8	54.3
Missouri	129	92.2	23.1	20.3	48.8
Montana	59	102.6	34.0	20.2	48.4
Nebraska	97	111.1	34.0	21.5	55.6
Nevada	18	115.8	34.2	34.7	46.9
New Hampshire	31	109.2	47.3	27.1	34.8

Table II-14.--Bedside nursing personnel per 100 average daily patients in AHA non-Federal short-term general and allied special hospitals, by State, 1972--continued

State	Number of hospitals	Full-time equivalent nursing personnel per 100 patients			
		Total	Registered nurses	Licensed practical nurses	Aides, orderlies, attendants
New Jersey	107	91.4	39.8	21.1	30.5
New Mexico	41	127.4	37.2	33.3	56.9
New York	334	94.0	36.7	20.0	37.3
North Carolina	135	97.0	26.7	25.5	44.7
North Dakota	56	114.6	32.9	27.1	54.7
Ohio	195	93.6	32.5	25.3	35.8
Oklahoma	121	112.5	17.4	27.4	67.2
Oregon	78	113.0	43.0	23.2	46.9
Pennsylvania	240	88.8	38.4	21.3	29.1
Rhode Island	14	105.5	47.1	33.2	25.2
South Carolina	70	98.1	23.7	26.7	47.7
South Dakota	52	108.9	33.8	22.3	52.8
Tennessee	136	91.6	17.1	30.6	43.9
Texas	477	103.1	20.1	40.6	42.5
Utah	31	107.8	43.2	30.5	34.0
Vermont	17	105.2	47.5	33.4	24.3
Virginia	98	95.5	30.7	25.0	39.8
Washington	107	112.8	49.7	36.2	26.8
West Virginia	69	99.5	24.8	26.6	48.0
Wisconsin	150	97.4	32.4	19.4	45.6
Wyoming	27	118.0	41.4	20.2	56.3

Source: U.S. Department of Health, Education, and Welfare, Division of Nursing. Nursing Personnel in Hospitals: 1972 Survey of Hospitals Registered with the American Hospital Association, DHEW Pub. No. (HRA) 75-16, Washington, U.S. Government Printing Office, 1974.

Table II-15.--Full-time registered nurses and licensed practical/vocational nurses per 1,000 residents in nursing homes by region and State, 1973

State and region	RN	LPN/LVN	State and region	RN	LPN/LVN	State and region	RN	LPN/LVN
United States	34	47	East South Central	20	59	West North Central	24	30
			Alabama	21	81	Iowa	22	31
New England	50	48	Kentucky	19	34	Kansas	19	20
Connecticut	60	40	Mississippi	26	72	Minnesota	29	30
Maine	37	38	Tennessee	18	59	Missouri	24	40
Massachusetts	46	54				Nebraska	21	26
New Hampshire	64	40	West South Central	15	60	North Dakota	28	21
Rhode Island	38	37	Arkansas	19	51	South Dakota	28	21
Vermont	66	74	Louisiana	21	59			
			Oklahoma	16	43	Mountain	44	49
Middle Atlantic	55	56	Texas	13	68	Arizona	53	35
New Jersey	58	41				Colorado	48	53
New York	55	58	East North Central	31	43	Idaho	40	51
Pennsylvania	52	62	Illinois	28	37	Montana	46	45
			Indiana	31	30	Nevada	58	67
South Atlantic	35	52	Michigan	32	43	New Mexico	34	54
Delaware	51	31	Ohio	32	68	Utah	24	50
District of Columbia	34	54	Wisconsin	31	30	Wyoming	39	36
Florida	46	59						
Georgia	23	62				Pacific	36	38
Maryland	38	41				Alaska	84	48
North Carolina	29	40				California	34	40
South Carolina	38	53				Hawaii	63	70
Virginia	33	49				Oregon	35	24
West Virginia	35	54				Washington	40	34

Source: Inpatient Health Facilities as Reported from the 1973 MFI Survey, Vital and Health Statistics, Series 14, No. 16, NCHS, HRA, PHS, HEW, 1976.

Table II-16.--Distribution of agencies and nurses employed for public health work, January 1974

Type of agency	Number of agencies	Total nurses	Registered nurses			Licensed practical nurses		
			Total	Full time	Part time	Total	Full time	Part time
Total	11,516	65,105	61,036	54,008	7,028	4,069	3,606	463
National/Federal agency	10	864	863	799	64	1	1	-
University	303	1,197	1,197	1,049	148	-	-	-
State agency	207	3,055	2,789	2,589	200	266	255	11
Local agency	10,996	59,989	56,187	49,571	6,616	3,802	3,350	452
Official	2,867	25,918	24,240	20,985	3,255	1,678	1,487	191
Health Department	1,810	19,225	18,093	15,763	2,330	1,132	1,051	81
Other official	1,057	6,693	6,147	5,222	925	546	436	110
Organized categorical program	412	2,652	2,110	1,765	345	542	479	63
Mental Health	116	845	720	632	88	125	119	6
Neighborhood health center/OEO	156	722	587	493	94	135	108	27
Other categorical	140	1,085	803	640	163	282	252	30
Combination	51	2,324	2,145	1,946	199	179	164	15
Nonofficial	620	6,709	6,035	4,684	1,351	674	576	98
Visiting Nurse Association	567	6,493	5,830	4,548	1,282	663	567	96
Other nonofficial	53	216	205	136	69	11	9	2
Organized home health	399	2,248	1,859	1,363	496	389	314	75
Hospital based program	239	1,081	984	737	247	97	78	19
Other home health	160	1,167	875	626	249	292	236	56
Board of Education	6,647	20,138	19,798	18,828	970	340	330	10

Source: U.S. Department of Health, Education, and Welfare, Division of Nursing. Survey of Public Health Nursing, 1974. Unpublished preliminary data.

Table II-17.--Ratios of full-time registered nurses employed for public health work in State and local agencies, with and without local Boards of Education, by State, January 1974

State	State and local agencies including local Boards of Education		State and local agencies excluding local Boards of Education	
	Nurses per 100,000 population	Population per nurse	Nurses per 100,000 population	Population per nurse
U.S. and territories	25.3	3,950	16.1	6,182
Alabama	15.1	6,623	13.7	7,266
Alaska	54.9	1,820	34.6	2,888
Arizona	52.8	1,894	22.2	4,494
Arkansas	17.8	5,590	13.4	7,425
California	22.9	4,364	12.5	7,974
Colorado	34.0	2,939	28.9	3,454
Connecticut	42.7	2,337	24.5	4,069
Delaware	50.7	1,971	20.6	4,850
District of Columbia	44.0	2,271	44.0	2,271
Florida	20.8	4,791	20.5	4,856
Georgia	21.2	4,712	19.2	5,185
Hawaii	27.3	3,659	26.2	3,804
Idaho	28.2	3,545	17.8	5,610
Illinois	14.2	7,034	10.8	9,215
Indiana	17.2	5,802	11.0	9,079
Iowa	22.0	4,526	9.3	10,658
Kansas	24.3	4,114	12.9	7,720
Kentucky	23.9	4,169	22.6	4,415
Louisiana	16.8	5,930	14.8	6,755
Maine	29.6	3,374	22.3	4,468

Table II-17.--Ratios of full-time registered nurses employed for public health work in State and local agencies, with and without local Boards of Education, by State, January 1974--continued

State	State and local agencies including local Boards of Education		State and local agencies excluding local Boards of Education	
	Nurses per 100,000 population	Population per nurse	Nurses per 100,000 population	Population per nurse
Maryland	34.5	2,892	31.7	3,153
Massachusetts	35.4	2,822	25.2	3,961
Michigan	15.9	6,281	12.9	7,751
Minnesota	23.5	4,241	11.8	8,455
Mississippi	20.1	4,970	16.2	6,141
Missouri	24.4	4,098	11.3	8,806
Montana	25.3	3,945	17.7	5,645
Nebraska	16.5	6,055	7.7	2,899
Nevada	22.1	4,525	15.5	6,430
New Hampshire	47.1	2,125	26.1	3,822
New Jersey	38.9	2,567	13.6	7,336
New Mexico	38.3	2,605	21.9	4,556
New York	31.3	3,187	16.5	6,052
North Carolina	23.3	4,285	20.3	4,910
North Dakota	15.3	6,502	15.3	6,502
Ohio	20.8	4,802	14.2	7,026
Oklahoma	17.0	5,883	11.3	8,824
Oregon	24.8	4,021	21.3	4,678
Pennsylvania	32.2	3,098	12.3	8,094
Rhode Island	35.9	2,784	20.9	4,781
South Carolina	32.7	3,058	27.2	3,674
South Dakota	21.3	4,686	14.4	6,932
Tennessee	20.9	4,773	19.7	5,056
Texas	23.6	4,223	9.6	10,415
Utah	23.5	4,254	20.6	4,836

Table II-17.--Ratios of full-time registered nurses employed for public health work in State and local agencies, with and without local Boards of Education, by State, January 1974--continued

State	State and local agencies including local Boards of Education		State and local agencies excluding local Boards of Education	
	Nurses per 100,000 population	Population per nurse	Nurses per 100,000 population	Population per nurse
Vermont	65.4	1,526	32.8	3,043
Virginia	26.8	3,724	22.2	4,486
Washington	21.0	4,761	14.5	6,859
West Virginia	19.6	5,085	13.7	7,267
Wisconsin	18.3	5,447	16.0	6,248
Wyoming	23.1	4,317	14.1	7,072
Guam	123.5	809	87.0	1,148
Puerto Rico	29.2	3,419	26.4	3,782
Virgin Islands	148.9	671	116.8	855

Source: U.S. Department of Health, Education, and Welfare, Division of Nursing. Survey of Public Health Nursing, 1974. Unpublished preliminary data.

Table II-18.—Percent of graduations from master's programs by functional area of study, 1964-74

Academic year	Total		Percent of graduations by functional area of study				
	Number	Percent	Teaching	Administration	Supervision	Advanced clinical practice	Other
1973-74	2,643	100.0	32.7	6.5	3.4	56.9	0.5
1972-73	2,446	100.0	31.1	6.3	4.5	55.2	2.9
1971-72	2,135	100.0	34.4	11.7	8.2	45.3	0.4
1970-71	2,083	100.0	38.9	9.0	9.2	42.5	0.4
1969-70	1,988	100.0	38.9	12.4	9.1	38.8	0.8
1968-69	1,766	100.0	51.0	12.8	10.9	24.8	0.5
1967-68	1,615	100.0	52.8	10.2	14.3	22.7	0.0
1966-67	1,534	100.0	49.0	16.1	12.5	21.1	1.3
1965-66	1,279	---	---	---	---	---	---
1964-65	1,379	100.0	50.3	21.2	11.0	13.6	3.9

Note: Dashes indicate no data available.

Source: National League for Nursing. Some statistics on Baccalaureate and Higher Degree Programs in Nursing, 1974-1975.

Table II-19.--Average hourly earnings of registered nurses in non-Federal hospitals, by type of position, by region and metropolitan area, August 1972[1] and August 1975

Region and metropolitan area	Directors of nursing			Supervisors			Head nurses			General duty nurses		
	Average hourly earnings		Average annual percent change	Average hourly earnings		Average annual percent change	Average hourly earnings		Average annual percent change	Average hourly earnings		Average annual percent change
	1972	1975		1972	1975		1972	1975		1972	1975	
Northeast												
Boston, Mass.	$8.34	$10.25	7.1	$6.05	$7.15	5.7	$5.48	$6.34	5.0	$4.63	$5.56	6.3
Buffalo, N.Y.	7.99	8.97	3.9	6.04	7.35	6.8	5.22	6.32	6.6	4.30	5.18	6.4
New York, N.Y.-N.J.	9.70	12.31	8.3	6.60	8.77	9.9	5.78	7.80	10.5	5.46	6.96	8.4
Philadelphia, Pa.-N.J.	7.62	9.78	8.7	5.58	6.82	6.9	5.13	6.27	6.9	4.31	5.37	7.6
South												
Atlanta, Ga.	7.55	9.11	6.5	5.15	6.31	7.0	4.75	5.84	7.1	4.29	4.88	4.4
Baltimore, Md.	8.54	10.83	8.2	6.03	7.51	7.6	5.44	6.63	6.8	4.71	5.95	8.1
Dallas-Ft. Worth, Tex.	6.19	8.13	9.5	5.25	6.06	4.9	4.66	5.70	7.0	4.13	4.90	5.9
Houston, Tex.	6.23	8.32	10.1	5.15	6.51	8.1	4.51	5.65	7.8	4.19	5.10	6.8
Memphis, Tenn.-Ark.	6.39	8.91	11.7	5.14	6.25	6.7	4.77	5.80	6.7	4.28	5.12	6.2
Miami, Fla.	7.98	9.98	7.7	5.72	7.37	8.8	5.20	6.61	8.3	4.50	5.40	6.3
Washington, D.C.-Md.-Va.	8.46	10.77	8.4	6.40	7.57	5.8	5.74	6.92	6.4	4.56	5.59	7.0
North Central												
Cleveland, Ohio	[2]/6.66	8.10	6.7	[2]/5.71	7.04	7.2	[2]/5.16	6.50	8.0	[2]/4.51	5.61	7.6
Chicago, Ill.	8.49	10.49	7.3	6.08	7.79	8.6	5.53	6.90	7.7	4.65	5.78	7.5
Detroit, Mich.	9.08	10.41	4.7	6.21	7.43	6.2	5.65	6.84	6.6	4.93	5.98	6.7
Kansas City, Kans.-Mo.	NR	9.62	---	NR	6.52	---	NR	6.07	---	NR	5.13	---
Milwaukee, Wis.	7.93	9.93	7.8	5.95	7.30	7.1	5.34	6.53	6.9	4.48	5.46	6.8
Minneapolis-St. Paul, Minn.	8.14	9.55	5.5	5.71	7.28	8.4	5.24	6.54	7.8	4.50	5.59	7.5
St. Louis, Mo.-Ill.	6.83	8.23	6.4	5.50	6.94	8.1	4.99	6.18	7.4	4.33	5.13	5.8
West												
Denver-Boulder, Colo.	7.38	8.73	5.8	5.59	7.30	9.3	4.70	6.44	11.1	4.26	5.42	8.4
Los Angeles-Long Beach, Calif.	8.09	10.18	8.0	6.45	8.35	9.0	5.85	7.22	7.3	4.98	6.26	7.9
Portland, Ore.	7.03	9.69	11.3	5.35	7.86	13.7	4.83	7.02	13.3	4.38	6.05	11.4
San Francisco-Oakland, Calif.	8.35	10.95	9.5	6.68	8.68	9.1	6.15	8.01	9.2	5.35	7.02	9.5
Seattle-Everett, Wash.	7.89	10.45	9.8	5.54	6.56	5.8	5.01	6.57	9.5	4.43	5.74	9.0

1/ Weekly earnings published in August 1972 hospital study have been converted to hourly earnings based on average standard workweek.
2/ Earnings as of February 1972.

Note: NR = No report. Dashes indicate no data or data do not meet publication criteria.

Sources: U.S. Department of Labor, Bureau of Labor Statistics. Earnings and Supplementary Benefits in Hospitals, August 1972. Ibid. Industry Wage Survey, Hospitals, August 1975. Prepublished data. Ibid. Summary Press Release on Cleveland Hospitals, February 1972.

Table II-20.--Average hourly earnings of clinical nursing specialists in non-Federal hospitals, by region and metropolitan area, August 1975

Region and Metropolitan Area	Average hourly earnings					
	All clinical specialists 1/	Medical surgical specialists	Psychiatric specialists	Clin spec. pediatrics	Clin. spec. obstetrics	Other clinical specialists
Northeast						
Boston, Mass.	$6.72	$7.41	---	$7.38	$7.54	---
Buffalo, N.Y.	---	---	---	---	---	---
New York, N.Y.-N.J.	8.73	8.74	$8.30	---	---	---
Philadelphia, Pa.-N.J.	6.49	---	6.87	6.50	---	---
South						
Atlanta, Ga.	6.37	---	---	---	---	---
Baltimore, Md.	7.45	7.27	---	---	---	$7.50
Dallas-Ft. Worth, Tex.	---	5.31	---	---	---	---
Houston, Tex.	---	---	---	---	---	---
Memphis, Tenn.-Ark.	---	---	---	---	---	---
Miami, Fla.	---	---	---	---	---	---
Washington, D.C.-Md.-Va.	6.86	7.71	---	---	---	7.38
North Central						
Cleveland, Ohio	2/ 6.57	---	2/ 6.08	---	---	---
Chicago, Ill.	7.03	7.16	---	---	---	7.06
Detroit, Mich.	6.69	---	---	---	---	6.92
Kansas City, Kans.-Mo.	6.00	---	---	---	---	---
Milwaukee, Wis.	6.60	---	---	---	---	---
Minneapolis-St. Paul, Minn.	---	---	---	---	---	---
St. Louis, Mo.-Ill.	6.43	---	---	---	---	---
West						
Denver-Boulder, Colo.	---	---	---	---	---	---
Los Angeles-Long Beach, Calif.	7.57	---	---	---	---	---
Portland, Ore.	7.56	---	---	---	---	---
San Francisco-Oakland, Calif.	7.50	---	---	---	---	---
Seattle-Everett, Wash.	---	---	---	---	---	---

1/ Includes data for workers in this classification in addition to those shown separately.
2/ Earnings as of February 1972.

Note: Dashes indicate no data or data do not meet publication criteria.

Source: U.S. Department of Labor, Bureau of Labor Statistics. Industry Wage Survey, Hospitals, August 1975. Prepublished data.

Table II-21.--Average hourly earnings of licensed practical nurses and nursing aides in non-Federal hospitals, by region and metropolitan area, August 1972[1/] and August 1975

Region and metropolitan area	Licensed practical nurses			Nursing aides		
	Average hourly earnings		Average annual percent change	Average hourly earnings		Average annual percent change
	1972	1975		1972	1975	
Northeast						
Boston, Mass.	$3.74	$4.37	5.3	$2.86	$3.53	7.3
Buffalo, N.Y.	3.24	3.97	7.0	2.62	3.23	7.2
New York, N.Y.-N.J.	4.06	5.59	11.3	3.55	4.81	10.7
Philadelphia, Pa.-N.J.	3.36	4.31	8.7	2.76	3.71	10.4
South						
Atlanta, Ga.	3.04	3.58	5.6	2.38	2.77	5.2
Baltimore, Md.	3.91	4.80	7.1	2.99	3.88	9.1
Dallas-Ft. Worth, Tex.	2.75	3.55	8.9	2.16	2.67	7.3
Houston, Tex.	2.84	3.55	7.7	2.08	2.70	9.1
Memphis, Tenn.-Ark.	3.14	4.00	8.4	2.48	2.99	6.4
Miami, Fla.	3.16	3.96	7.8	2.35	2.93	7.6
Washington, D.C.-Md.	3.49	4.33	7.5	2.81	3.55	8.1
North Central						
Cleveland, Ohio	3.24[2/]	4.13	7.2	2.61	3.37	7.6
Chicago, Ill.	3.69	4.66	8.1	2.99	3.72	7.6
Detroit, Mich.	3.94	4.83	7.0	2.93	3.64	7.5
Kansas City, Kans.-Mo.	NR	3.61	---	NR	2.82	---
Milwaukee, Wis.	3.31	4.13	7.7	2.61	3.44	9.6
Minneapolis-St. Paul, Minn.	3.30	4.10	7.5	2.70	3.28	6.7
St. Louis, Mo.-Ill.	3.20	3.99	7.6	2.40	3.05	8.3
West						
Denver - Boulder, Colo.	2.89	3.70	8.6	2.38	3.09	9.1
Los Angeles - Long Beach, Calif.	3.73	4.67	7.8	2.93	3.57	6.8
Portland, Ore.	3.39	4.30	8.3	2.70	3.62	10.3
San Francisco-Oakland, Calif.	4.16	5.25	8.1	3.68	4.91	10.1
Seattle, Everett, Wash.	3.03	3.96	9.3	2.68	3.54	9.7

1/ Weekly earnings published in August 1972 hospital study have been converted to hourly earnings based on average standard workweek.
2/ Earnings as of February 1972.

Note: NR = No report.

Sources: U.S. Department of Labor, Bureau of Labor Statistics. Earnings and Supplementary Benefits in Hospitals, August 1972.
Ibid. Industry Wage Survey, Hospitals, August 1975. Prepublished data.
Ibid. Summary Press Release on Cleveland Hospitals, February 1972.

Table II-22.--Average hourly earnings of registered nurses, licensed practical nurses and nursing aides in privately-owned nursing homes and related facilities, by region and metropolitan area, May 1973

Region and metropolitan area	Average hourly earnings					
	RN's		LPN's		Nursing aides	
	Full time	Part time	Full time	Part time	Full time	Part time
Northeast						
Boston	$4.51	$4.50	$3.62	$3.58	$2.40	$2.23
Buffalo	4.21	4.09	3.09	3.02	2.20	2.17
New York City	6.07	6.08	4.70	4.77	3.49	3.29
Philadelphia	4.20	4.00	2.95	2.75	2.14	2.01
South						
Atlanta	3.99	4.16	2.80	2.86	1.84	1.85
Baltimore	4.41	4.36	3.61	3.49	2.26	2.05
Dallas	4.15	3.73	2.38	2.84	1.72	1.67
Miami	4.22	4.12	3.38	3.18	2.03	2.15
Washington, D.C.	4.48	4.26	3.37	3.30	2.21	2.05
North Central						
Chicago	4.51	4.22	3.19	3.25	2.22	2.11
Cincinnati	4.31	4.08	3.07	3.05	1.90	1.81
Cleveland	4.19	4.01	3.08	2.96	1.96	1.78
Detroit	4.66	4.41	3.74	3.56	1.93	1.82
Minneapolis-St. P.	4.20	4.11	3.23	3.09	2.14	2.01
St. Louis	4.20	4.14	3.08	3.09	1.91	1.81
West						
Denver	3.76	3.69	2.83	2.73	1.77	1.74
Los Angeles	4.87	4.87	3.77	3.79	1.94	1.86
Portland	4.27	4.22	3.14	3.13	1.85	1.73
San Francisco	4.37	4.24	3.29	3.20	2.27	2.05
Seattle	4.02	3.94	2.94	2.85	1.88	1.80

196

Source: U.S. Department of Labor, Bureau of Labor Statistics. Industry Wage Survey. Nursing Homes and Related Facilities, May 1973.

197

Table II-23.--Median annual salaries of registered nurses in selected public health agencies, by type of agency and position, 1972-1975

Type of agency and position	1972	1973	1974	1975	Average annual percent change
Local official health agency					
Nurse director	$14,650	$15,400	$16,240	$17,500	6.1
Supervising nurse	12,336	12,850	13,425	14,413	5.3
All staff nurses	9,609	10,249	10,835	11,495	6.2
PHN fully qualified	10,530	10,879	11,376	12,033	4.6
Other registered nurse	9,132	9,649	10,084	10,626	5.2
Nonofficial agency					
Nurse director	14,525	15,030	15,225	16,400	4.1
Supervising nurse	11,092	11,469	12,160	12,714	4.7
All staff nurses	8,806	9,062	9,503	10,148	4.8
PHN fully qualified	9,419	9,578	9,985	10,715	4.4
Other registered nurse	8,506	8,758	9,149	9,815	4.9
Board of education 1/					
Supervising nurse	13,650	14,425	14,800	15,700	4.8
Staff nurse	9,705	10,552	10,616	11,605	6.1

1/ No director classification in boards of education.

Source: NLN, "Salaries in Community Health Services, 1972 to 1975," Nursing Outlook, December issues, 1972-1975.

able II-24.--Median annual salaries of licensed practical nurses and auxiliary nursing personnel in selected public health nursing agencies, 1972 - 1975 1/

Personnel	Median annual salary				Average annual percent change
	1972	1973	1974	1975	
ensed practical nurse	$6,634	$6,786	$7,210	$7,935	6.2
liary nursing personnel					
blic health assistant	7,150	6,072	6,997	7,382	1.1
e health aide	5,013	5,091	5,209	5,766	4.8
er auxiliary personnel	5,205	5,391	5,996	6,704	8.8

1/ Includes nonofficial agencies, official State and local health agencies, and combination services.

Source: National League for Nursing, "Salaries in Community Health Services," 1972 to 1975. Nursing Outlook, December issues, 1972-1975.

Table II-25.--Average weekly earnings of industrial registered nurses, February 1974 and July 1975

Region	Average weekly earnings		Average annual percent change
	February 1974	July 1975	
United States	$192.00	$220.50	10.3
Northeast	186.00	211.50	9.5
South	184.50	210.50	9.8
North Central	197.50	228.50	10.8
West	200.50	235.80	12.1

Source: U.S. Department of Labor, Bureau of Labor Statistics. Occupational Earnings in All Metropolitan Areas, February 1974. Also, prepublished data, July 1975.

Table II-26.--Annual salaries of full-time registered nurses in physicians' offices by geographic region, 1973

Annual salary	Total	Percent of nurses in geographic region			
		North-east	North Central	South	West
Total	100.0	100.0	100.0	100.0	100.0
Under $4,000	1.8	3.6	.1	4.6	-
$4,000-4,999	1.7	.4	2.9	2.3	.6
5,000-5,499	3.4	2.1	5.2	5.2	.7
5,500-5,999	4.6	5.6	5.8	1.5	5.4
6,000-6,499	7.6	2.8	11.2	10.5	4.2
6,500-6,999	11.9	12.3	13.9	11.3	9.9
7,000-7,499	11.9	13.5	14.3	12.4	7.8
7,500-7,999	12.1	7.6	6.2	19.3	15.1
8,000-8,499	12.2	6.0	9.3	11.3	20.1
8,500-8,999	5.2	6.3	7.4	2.9	4.4
9,000-9,999	7.1	9.8	8.6	5.6	5.3
$10,000 and over	7.8	7.5	3.6	4.3	15.5
Not determined	12.7	22.5	11.5	8.8	11.0
Mean salary	$7,734	$7,764	$7,529	$7,191	$8,442

Source: U.S. Department of Health, Education, and Welfare, Division of Nursing. Survey of Registered Nurses Employed in Physicians' Offices, September 1973. DHEW Pub. No. (HRA) 75-50. Washington, U.S. Government Printing Office, March 1975.

Table II-27.--Median salaries of full-time RN faculty members teaching in programs preparing registered nurses and practical nurses for licensure, by region, December 1973

Type of program and educational preparation of faculty	United States median salary	Region			
		Northeast median salary	South median salary	North central median salary	West median salary
All programs - RN					
total teaching faculty[1/]	$11,500	$12,100	$11,000	$11,236	$12,182
Less than baccalaureate	9,762	10,380	9,420	9,700	10,110
Baccalaureate	10,400	11,351	9,620	10,393	10,540
Master's and above	12,500	12,970	12,207	12,100	12,750
Diploma programs					
total teaching faculty[1/]	11,128	11,817	10,159	11,040	11,040
Less than baccalaureate	9,838	10,397	9,511	9,864	(2)
Baccalaureate	11,000	22,648	10,164	10,978	10,630
Master's and above	12,720	13,200	11,880	12,414	12,342
Baccalaureate programs					
total teaching faculty[1/]	11,940	12,200	12,000	11,250	11,904
Less than baccalaureate	(2)	---	(2)	---	(2)
Baccalaureate	9,000	9,200	9,000	8,912	8,500
Master's	12,000	12,087	12,387	11,500	11,904
Doctorate	16,800	16,870	17,000	17,050	16,000
Associate Degree programs					
total teaching faculty[1/]	11,650	12,841	10,056	11,630	13,273
Less than baccalaureate	8,635	(2)	(2)	(2)	(2)
Baccalaureate	9,822	10,000	9,251	10,300	10,830
Master's and above	13,080	13,513	11,600	13,275	14,360
All programs - LPN[3/]					
total teaching faculty[1/]	11,000	11,935	10,400	10,808	12,600
Less than baccalaureate	10,351	10,500	10,095	10,273	12,270
Baccalaureate	11,417	11,861	10,900	11,253	12,000
Master's and above	14,000	15,840	12,565	13,500	13,777

Table II-27.--Median salaries of full-time RN faculty members teaching in programs preparing registered nurses and practical nurses for licensure, by region, December 1973--continued

Type of program and educational preparation of faculty	United States median salary	Region			
		Northeast median salary	South median salary	North central median salary	West median salary
Board of education programs total teaching faculty[1]	11,000	11,951	10,450	10,971	11,488
Less than baccalaureate	10,402	10,503	10,074	10,575	11,557
Baccalaureate	11,340	11,700	10,935	11,229	10,952
Master's and above	14,365	15,983	12,175	13,826	13,173

1/ Includes faculty for whom educational preparation was not reported.
2/ Insufficient number to compute median.
2/ Includes all practical nursing programs whether or not operated by boards of education.

Source: American Nurses' Association. Report on the Survey of Salaries of Nursing Faculty and Administrators in Nursing Educational Programs, December, 1973. Kansas City, 1975.

Table II-28.--Median annual salaries of RN faculty members in nursing education programs, December 1973

Type of program and position	Median annual salary
Baccalaureate programs	
Total faculty	$12,075
Teaching assistant	8,600
Instructor	10,526
Assistant professor	12,400
Associate professor	15,061
Professor	19,798
Administrator	19,000
Associate degree programs	
All positions	12,065
Teacher	11,650
Administrator	16,136
Diploma programs	
All positions	11,417
Teacher	11,128
Administrator	15,390
Practical nurse programs	
All positions	11,398
Teacher	11,000
Administrator	14,073
Board of education programs - LPN	
All positions	11,340
Teacher	11,000
Administrator	14,000

Source: American Nurses' Association. Report on the Survey of Salaries of Nursing Faculty and Administrators in Nursing Educational Programs, December 1973. Kansas City, 1975.

Table II-29.-- Nurses admitted to the United States, 1970-75

	1970	1971	1972	1973	1974	1975	Total 1970-75
migrant nurses [1]							
tal admitted	4,934	6,442	6,851	6,335	5,331	6,131	36,024
neficiaries of occupational references							
ird Preference Admissions	728	984	961	823	1,688	1,980	7,164
justments	123	276	527	433	355	451	2,165
xth Preference Admissions	261	262	167	40	32	59	821
justments	52	108	202	78	62	66	568
tal	1,164	1,630	1,857	1,374	2,137	2,556	10,718
others	3,770	4,812	4,994	4,961	3,194	3,575	25,306
immigrant nurses [2]							
tal Admitted	1,159	1,321	1,889	3,133	2,580	2,329	12,411
stinguished merit and ability	7	716	1,486	2,673	2,096	2,084	9,062
change visitors	1,109	567	382	424	313	213	3,008
rainees	13	14	4	12	54	16	113
her temporary	30	19	17	22	63	6	157
ansferees		5		2	54	10	71
tal all nurses admitted	6,093	7,763	8,740	9,468	7,911	8,460	48,434

[1] Source: Table 8A, Annual Reports, Immigration and Naturalization Service, Department of Justice.
[2] Source: Table 16B, Annual Reports, Immigration and Naturalization Service, Department of Justice.

Table II-30.--Professional nurses admitted as immigrants,[1/] by region and country[2/] of last permanent residence, FY 1971-75

	1971	1972	1973	1974	1975
All countries	6,363	6,789	6,283	5,331	6,131
Europe	1,230	1,145	1,262	834	916
Germany	141	105	126	111	123
Ireland	124	168	203	95	64
United Kingdom	630	552	584	394	480
Other	335	320	349	234	249
Asia	2,969	3,811	3,578	3,457	4,183
Taiwan	109	171	182	125	139
India	169	536	594	827	1,289
Korea	526	736	743	988	866
Philippines	1,549	1,580	1,273	997	1,245
Thailand	343	438	394	235	295
Other	273	350	392	285	349
Africa	96	230	188	124	145
Oceania	84	99	112	73	76
North and Central America	1,721	1,323	958	715	695
Canada	1,021	773	529	333	309
Jamaica	245	186	114	105	88
Trinidad and Tobago	124	87	---	---	---
Other	331	277	315	277	298
South America	263	181	185	128	116
Guyana	142	74	---	---	---
Other	121	107	---	---	---

[1/] Permanent resident aliens.
[2/] Countries of last permanent residence of 100 or more entrants in any year are listed separately.

Source: Annual reports of Immigration and Naturalization Service, Department of Justice.

Table II-31.--Professional nurses entering the United States as nonimmigrant aliens, [1] by visa category and by region and country [2] of last permanent residence, FY 1972-75

	1972			1973			1974			1975		
	H[3]	J[4]	H&J	H[3]	J[4]	H&J	H[3]	J[4]	H&J	H[3]	J[4]	H&J
All Countries	1,507	382	1,889	2,707	424	3,131	2,212	313	2,525	2,113	226	2,339
Europe	318	44	362	373	36	409	188	35	223	243	29	272
Ireland	102	5	107	105	--	105	54	4	58	62	2	64
United Kingdom	198	5	203	248	9	257	114	9	123	171	9	180
Other	18	34	52	20	27	47	20	22	42	10	18	28
Asia	843	285	1,128	1,909	302	2,211	1,643	154	1,797	1,650	67	1,717
India	10	14	24	---	---	---	---	---	---	---	---	---
Japan	25	7	32	---	---	---	---	---	---	---	---	---
Korea	58	6	64	44	4	48	36	4	40	---	---	---
Philippines	728	240	968	1,824	252	2,076	1,580	119	1,699	1,633	36	1,669
Other	22	18	40	41	46	87	27	31	58	17	31	48
Africa	1	5	6	11	18	29	10	36	46	7	30	37
Oceania	24	4	28	82	6	88	51	3	54	12	4	16
Australia	23	4	27	71	5	76	48	2	50	9	3	12
Other	1	---	1	11	1	12	3	1	4	3	1	4
North & Central America	318	28	346	324	35	359	311	31	342	193	27	220
Canada	281	7	288	248	1	249	233	6	239	107	3	110
Jamaica	10	5	15	22	3	25	10	1	11	18	2	20
Mexico	---	---	---	---	---	---	1	---	1	23	7	30
Other	27	16	43	54	31	85	67	24	91	45	15	60
South America	3	16	19	8	27	35	9	54	63	8	69	77
Bolivia	---	---	---	---	1	1		7	7	---	28	28
Other	---	---	---	8	26	34	9	47	56	8	41	49

1/ Temporary resident aliens.
2/ Countries of last permanent residence of 20 or more entrants listed separately.
3/ "H" visas are assigned to persons entering United States for purposes of employment.
4/ "J" visas are assigned to persons entering the United States on student status as exchange-visitors or trainees.

Source: Annual reports of Immigration and Naturalization Service, Department of Justice.